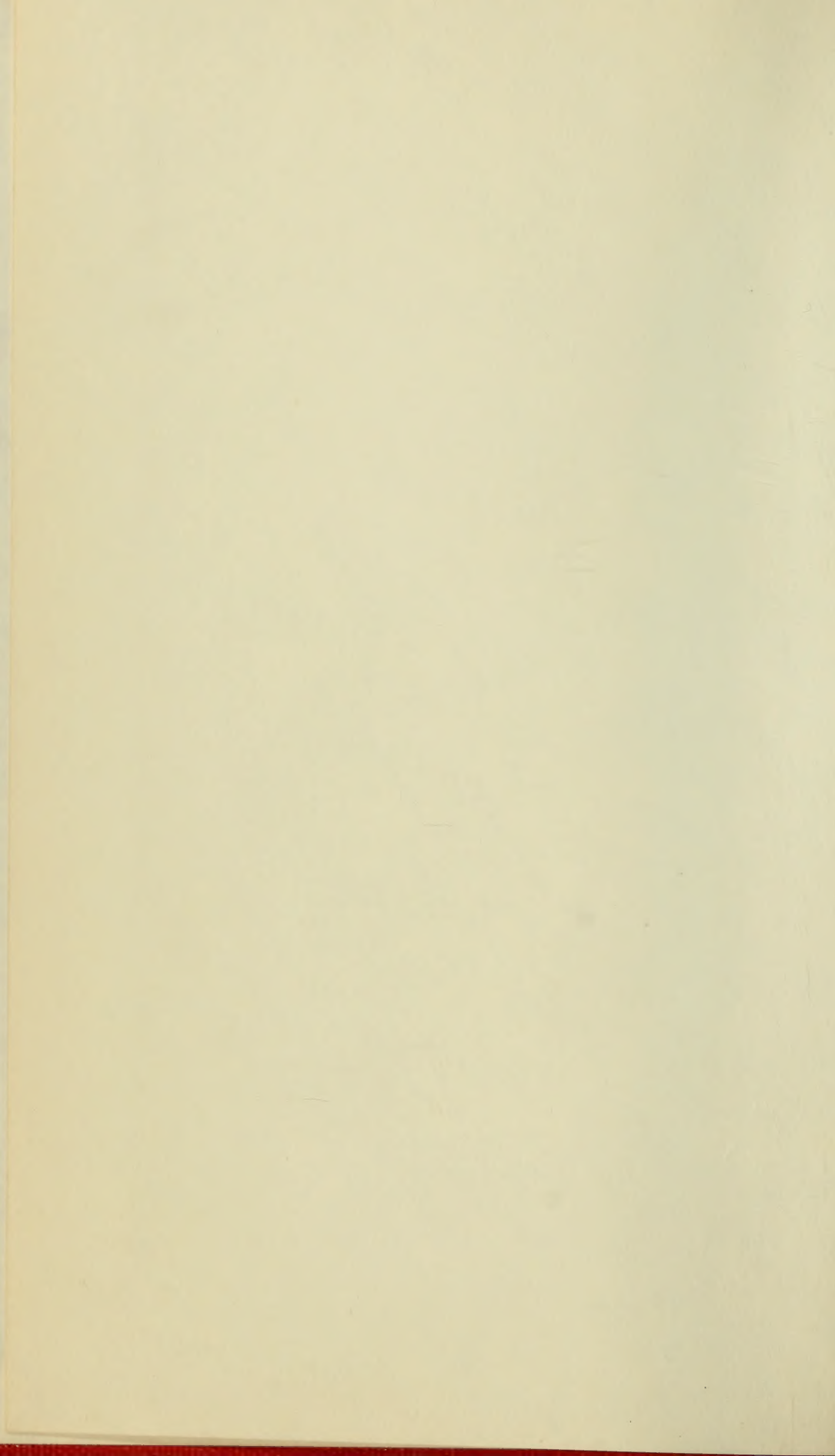
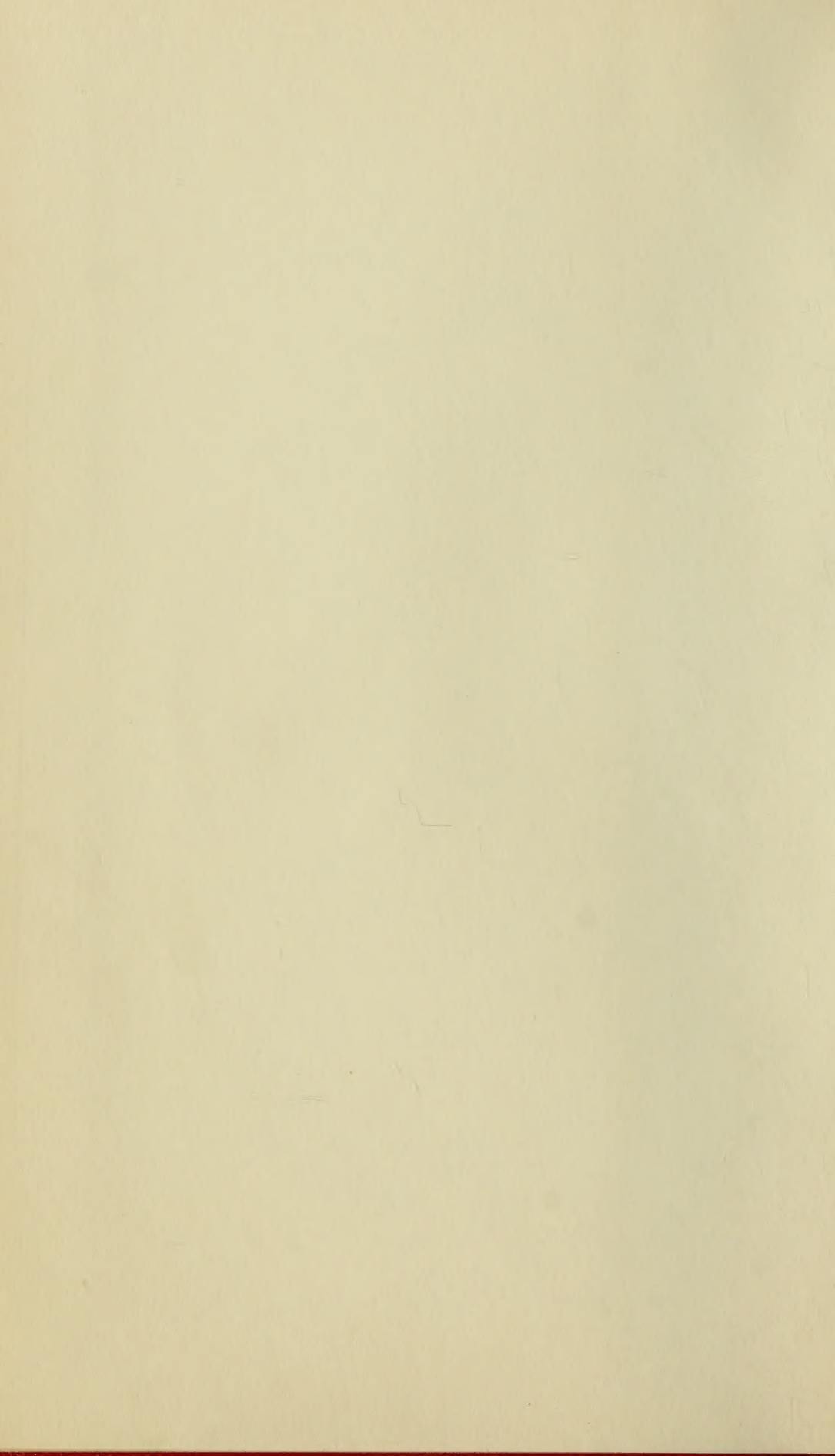


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List of Original Contributors to Volume IX.

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SUPPLEMENTARY INDEX OF AUTHORS.

A.

Abbott, Frank.....	New York City.
Adair, R. B.....	Gainesville, Ga.
Allan, Geo. S.....	New York City.
Allen, John.....	“ “
Ames, W. B.....	Chicago.
Andres, J. S.....	Montreal, Canada.
Andrews, R. R.....	Cambridge, Mass.
Andrieu, E.....	Paris, France.
Angle, E. H.....	Minneapolis, Minn.
Atkinson, Wm. H.....	New York City.

B.

Baldwin, A. E.....	Chicago.
Barker, C. C.,.....	Meriden, Conn.
Barker, Wm.....	Providence, R. I.
Barnum, H. L.....	Chicago.
Barrett, W. C.....	Buffalo, N. Y.
Baumgardner, I. G.....	Philadelphia.
Bennett, A. G.....	“
Bodecker, C. F. W.	New York City.
Bogue, E. A.....	“ “
Bouchard, Prof.....	Paris, France.
Brewstin, R. C.....	Brooklyn.
Brophy, T. W.....	Chicago, Ill.
Bristal, L. W.....	Lockport, N. Y.

Brown, E. P.....	—Flushing, L. I.
Bryan L. C.....	Basil, Switzerland.
Busch, Prof.....	Berlin, Ger.

C.

Cabanes, M. A.....	Paris, France.
Carr, C. S.....	Jackson, Mich.
Carr, Wm.....	New York City.
Carroll, C. C.....	Meadville, Pa.
Cheney, G. T.....	St. Johnsbury, Vt
Chewning, G. H.....	Fredricksburg, Va.
Chisholm, C. S.....	Tuscaloosa, Ala.
Chupein, T. F.....	Philadelphia.
Cryer, M. H.....	“
Cunningham, Geo.....	Cambridge, Eng.
Curtis, G. L.....	Syracuse, N. Y.

D.

Daly, J. A.....	Washington, D. C.
Darby, E. T.....	Philadelphia.
Davenport, J. B.....	Paris, France.
Davis, L. L.....	Eaton Rapids, Mich.
Davis, N. S., M.D.....	Chicago.
Downs, E. D.....	Owego, N. Y.

E.

Evans, W. W.....	Washington, D. C.
------------------	-------------------

F.

Farrar, J. N. New York City.
 Faught, L. Ashley Philadelphia.
 Fillebrown, Thos. Portland, Me.
 Flagg, J. Foster. Philadelphia.
 Fletcher, M. H. Cincinnati.
 Forberg, Elof. Stockholm, Sweden.
 Francis, C. E. New York City.
 Freeman, W. B. Chicago.
 Friedrichs, G. J. New Orleans.
 Fuller, A. H. St. Louis.
 Funchenberg, W. F. Pittsburg, Pa.

G.

Galbreath, E. A. Hanover, Germany.
 Gastrell, J. A. Penzance, Eng.
 Genese, D. Baltimore.
 Geran, J. P. Brooklyn.
 Gilmer, T. L. Quincy, Ill.
 Goddard, C. L. San Francisco.
 Guilford, S. H. Philadelphia.

H.

Harlan, A. W. Chicago.
 Harroon, C. H. Toledo, O.
 Harvey, H. F. Cleveland, O.
 Harwood, G. F. Worcester, Mass.
 Hasbrouck, F. New York.
 Haskell, L. P. Chicago.
 Hayhurst, J. Lambertville, N. J.
 Heitzman, Carl. New York City.
 Herring, H. C. Concord, N. C.
 Hesse, Prof. Leipzig, Germany.
 Hodgkin, J. E. Washington, D. C.
 Horton, W. P. Cleveland, O.
 Hunt, A. O. Iowa City.
 Hunt, E. Finley Washington City.

I.

Ingersoll, L. C. Keokuk, Iowa.
 Ivy, Robert S. China.

J.

Jackson, V. H. New York City.
 Jenison, M. G. Minneapolis, Minn.

Johnson, C. N. Chicago, Ill.
 Johnston, W. A. Peoria, Ill.

K.

Kella, C. E., Jr. New Orleans.
 Kidder, J. H. Lawrence, Mass.
 Kingsbury, C. A. Philadelphia.
 Kirk, E. C. "
 Kirk, S. T. Kokomo, Ind.
 Kitchen, C. A. Rockford, Ill.

L.

Lewis, J. Hall. Washington City.
 Little, J. Bond. New York City.
 Lankey, E. F. Patterson, N. J.
 Ludwig, S. Chicago.

M.

McCauley, G. H. Janesville, Wis.
 McLean, E. P. Boston, Mass.
 MacLeod, W. B. Edinburg, Scotland.
 Magill, W. E. Erie, Pa.
 Marlow, F. W. Philadelphia, Pa.
 Marriner, J. Frank. Ottawa, Ill.
 Marshall, J. S. Chicago.
 Marshall, M. C. Little Rock, Ark.
 Maxfield, G. A. Holyoke, Mass.
 Mayer, Chas. Springfield, Mass.
 Merriam, H. C. Salem, Mass.
 Miller, W. R. Berlin, Germany.
 Miller, W. D. Allentown, Pa.
 Moody, J. D. Mendota, Ill.
 Moore, E. C. Danville, Mich.
 Moulton, W. N. St. Louis, Mo.
 Mummery, J. Howard. London, Eng.
 " M. W. J., Mrs. Bay St. Louis, Miss.
 Myrder, Herman, M.D. Buffalo, N. Y.

N.

Newkirk, Garret. Chicago.
 Niles, E. S. Boston, Mass.
 Noel, L. G. Nashville, Tenn.
 Northrup, A. L. New York City.
 Noyes, E. Chicago.

O.

Osmun, J. Allen,.....Newark, N. J.
 Ottofy, L.....Chicago.
 Ottolengui, B. A. R.,...New York City.

P.

Palmer, J. G.....,New Brunswick, N. J
 Palmer, S. B.....Syracuse, N.Y.
 Park, Roswell, M.D.....Buffalo, N.Y.,
 Parr, H. A.....New York City.
 Parsons, H. W.Wamego, Kan.
 Parsons, J. H.Boulder, Colo.
 Patrick, J. J. R.Belleville, Ill.
 Peabody, D. D.....Stoneham, Mass.
 Peirce, C. N.....Philadelphia.
 Perry, S. G.....New York City.
 Potter, W. H.Boston.
 Price, S. B.....New York City.
 Pruyn, C. P.....Chicago.

R.

Rawls, A. O.Lexington, Ky.
 Register, H. C.Philadelphia.
 Reid, J. G.Chicago.
 Richards, W. H.....Knoxville, Tenn.
 Rockwell, H. C...Benton Harbor, Mich.
 Rohland, C. B.....Alton, Ill.
 Rollins, W. H.....Boston, Mass.

S.

Sailer, Z. T.....New York City.
 Salomon, E. S.....Chicago.
 Schneider, Theo.....Balse, Switzerland.
 Seabury, F. W.....Providence, R.I.
 Shephard, L. D.....Boston.
 Sherman, H. L.San Francisco, Cal.
 Sitherwood, G. D.....Bloomington, Ill.
 Smith, B. HollyBaltimore.
 Smith, C. Cutler.....Ilian, N.Y.
 Smith, J. S.....Lancaster, Pa.
 Snow, Geo. B.....Buffalo, N.Y.
 Stanton, J. E.....Boston, Mass.

Starr, E. T.....Philadelphia.
 Stevens, S. G.....Boston, Mass.
 Stockton, C. S.Newark, N. J.
 Story, Jno. C.....Dallas, Texas.
 Stowell, C. H.....Ann Arbor, Mich.
 Stowell, S. S.....Pittsfield, Mass.
 Stubblefield, D. R.....Nashville, Tenn.
 Sudduth, W. X.....Philadelphia.
 Swain, E. D.....Chicago.

T.

Taft, J.Cincinnati, O.
 Taggart, W. H.....Freeport, Ill.
 Talbot, E. S.....Chicago.
 Taylor, C. R.....Streator, Ill.
 Tenison, W. D.....Minneapolis, Minn.
 Thayer, W. I.....Hoboken, N. J.
 Thompson, A. H.Topeka, Kan.
 Thompson, J. S.Atlanta, Ga.
 Timme, C. A.Hoboken, N. J.
 Townsend, E. L.....Los Angeles, Cal.
 Truax, W. E.....Freehold, N. J.
 Trueman, W. H.....Philadelphia.
 Truman, Jas.....“
 Turner, V. E.....Raleigh, N. C.

V.

Van Woert, F. T.....Brooklyn, N. Y.

W.

Wardlaw, W. C.....Augusta, Ga.
 Waters, G. F.....Boston, Mass.
 Waters, T. Sol.....Baltimore.
 Watkins, S. C. G.....Mont Clare, N. J.
 Weagant, G. H.....Cornwall, Conn.
 Weld, G. W.New York City.
 Werner, J. G. W.....Boston.
 Whitefield, G. W.....Evansville, Ill.
 Wilson, I. P.....Burlington, Iowa.
 Winkler, Geo.....Augusta, Ga.
 Woodhouse, R. H....London, England.

Y.

Younger, W. J.San Francisco, Cal.

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Original Communications.

CONTRIBUTIONS TO THE HISTORY OF DEVELOPMENT
OF THE TEETH.

BY CARL HETZMANN, M. D., AND C. F. W. BÖTTCHER, D. D. S., M. D. S.

CONTINUED FROM PAGE 623, Vol. VIII.

V. Anomalies of enamel. It is a common feature to teeth of rachitic children that the interstices between the enamel prisms are wide, and their tenants, the enamel fibers, are very distinct, often running a wavy course independent of the contours of the enamel prisms. The prisms themselves are finely granular, without distinct cross-lines. These features are explained by a deficient calcification of the enamel, which, at the same time, allows the cutting of thin sections of the enamel after it has been softened in chromic acid solution, while it is impossible to obtain sections of normal enamel in the same manner. In a rachitic fetus eight months old, the writers have observed dark brown portions in the enamel, which are to be considered as pigmentations of the enamel rods. Another feature in the enamel of rachitic embryos is a markedly wavy course taken by the enamel prisms, so much so that

in a strictly longitudinal section alternate layers of enamel prisms will appear, some of which are cut longitudinally, while others are transverse. (See Fig. 40.)



FIG. 40. *Anomalous enamel of a rhachitic fetus seven and a half months old.*

- EE. Enamel organ of medullary character arisen from the external epithelium.
- E. Enamel composed of prisms of a markedly wavy course.
- M. Cluster of medullary corpuscles, *i. e.*, non-calcified enamel tissue.
- IL. Interzonal layer filled with medullary corpuscles.
- D. Dentine.

Magnified 500 diam.

Dr. Frank Abbott has already drawn attention to the fact that transverse sections of enamel prisms, alternating with longitudinal sections, are not caused by an interlacing of the enamel prisms, but by a wavy or devious course of the enamel prisms themselves,

and our specimens have furnished satisfactory proof of the correctness of the latter view.

Not infrequently we observe at the summit of the dentine, in the interzonal layer, medullary corpuscles, either arranged in rows or irregularly scattered in the vicinity of the dentine. Such forma-

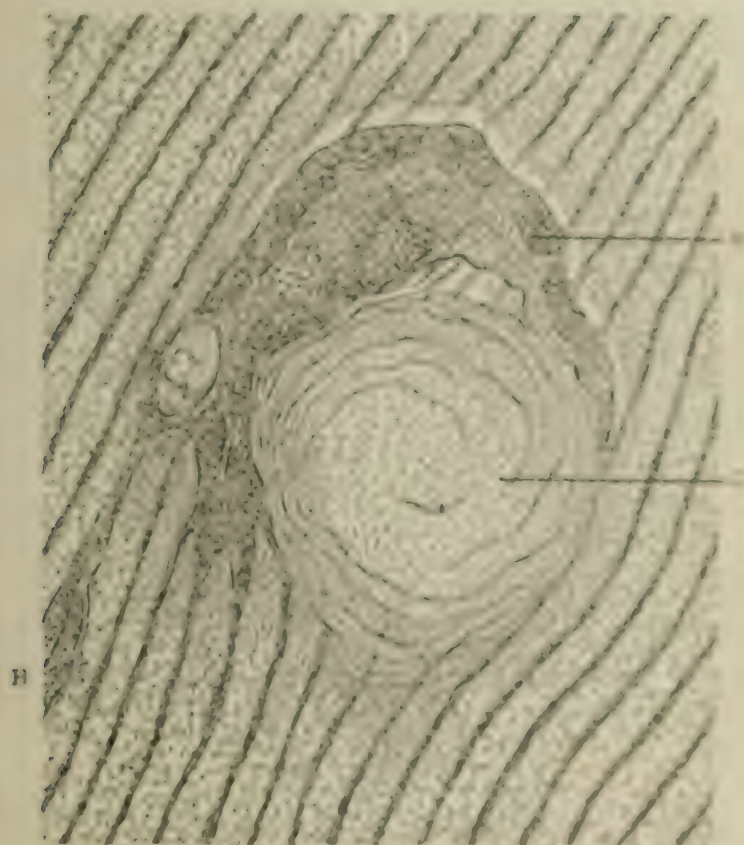


FIG. 41. Medullary space and pulp space in the section of a tooth of a rhachitic fetus eight months old.

- M. Medullary corpuscles filling a connective space in the dentine.
- P. Pulp space in the connective space replacing a medullary medulline.
- E. Enamel concentrically striated zone.

Magnified 600 times.

tions scarcely admit of any other interpretation than that the medullary elements from which the enamel prisms originate have not been calcified, but remained in an embryonal state. (See Fig. 40, M. and II.)

In specimens from a rhachitic fetus seven and a half months old, the enamel appeared bordered by a medullary tissue, whose origin could directly be traced from the buds and clusters, the remains of

the external epithelium. Here, therefore, our previous assumption, that the external epithelium likewise furnishes material for the increase of the enamel, can be directly proven.

VI. Anomalies of the dentine. The dentine of all rhachitic teeth is conspicuous by wide dentinal canaliculi, in which the dentinal fibers and their lateral offshoots are easily discernible. The basis-substance shows a more or less marked reticular structure, without the application of any reagent. In a fœtus eight months old the writers found peculiar formations of dentine, which evidently are caused by a deficient calcification of this tissue. (See Fig. 41.)

Such spaces send offshoots upward and downward into the dentine, which represent either conically widened dentinal canals, or broad routes replacing the same. The spaces and their larger branches are filled with medullary corpuscles in all stages of development. Where the space inosculates with dentinal canaliculi, the tenants of the latter are coarse fibrillæ, with spindle-shaped widenings composed of large granules. Both within these spaces and in their vicinity we observe globular formations which exhibit the features of badly developed secondary dentine, or globular dentine, resembling the structure of the dentine of the so-called pulp-stones, or denticles. Spaces of this description resemble the interglobular spaces of Czernak, but they are more irregular and much larger.

VII. Anomalies of the papilla. The writers have described and illustrated, in Fig. 37, anomalous papillæ of peculiar shapes. In such papillæ we often observe crystals of hæmatoidine grouped together in clusters, the origin of which must be sought for in an imbibition by the tissue of the coloring matter of the blood at a very early stage of development. The writers furthermore wish to draw attention to peculiar formations met with in the medullary tissue of the papilla. (See Fig. 42.)

Such globules we have observed only at the summit of the papilla, and in close connection with medullated nerve fibers. The globules are pale, finely granular, and with either smooth or lobulated contours. Their interior shows faint marks of division, which indicate that the globules have arisen from medullary corpuscles, or clusters thereof. We are unable to determine the nature of such corpuscles, which seem to be in relation to newly forming medullated nerves. All the nerve fibers seem, however, to run be-

tween the globules, although it appears in the drawing as if a bundle of nerves inosculated with a globule. This may be explained by a devious course of the nerve bundle.

The most interesting feature of such papille is that the medullated nerves first appear at the summit of the papilla, whereas the lower portions of the papillæ are free from nerves, and only exhibit scanty capillary blood-vessels. The nerves still appear to be composed of rows of medullated corpuscles, without any trace of the myeline sheath. Whether or not axis cylinders are present the writers could not

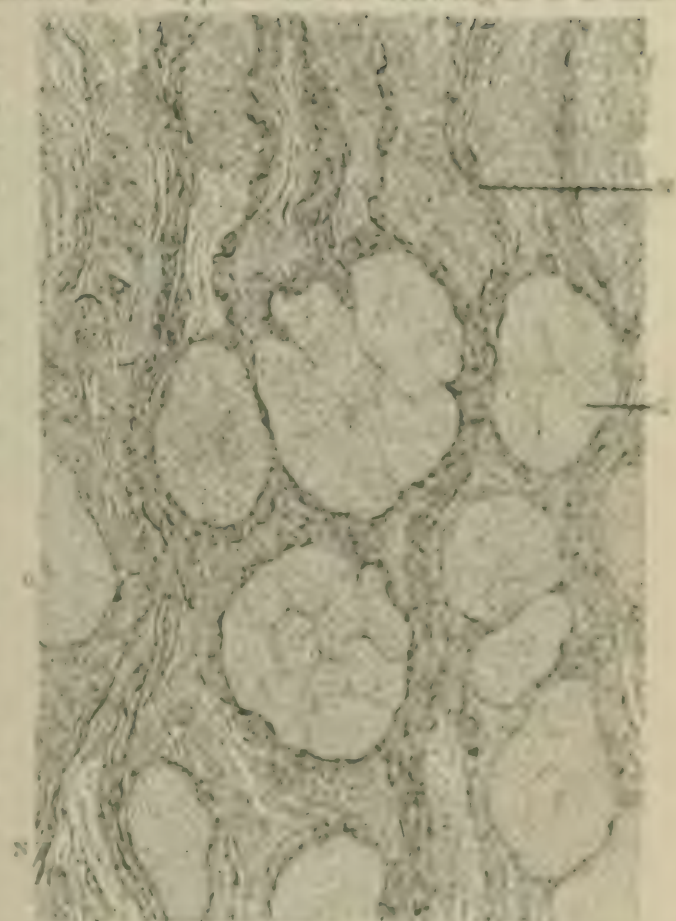


FIG. 42. *Continued to the Apical of a Whitaker's lower molar and a half month old.*

GG. Granular globules, partly smooth, partly beaded.
NN. Medullated nerves.

Magnified 200 diam.

determine in the longitudinal sections before them. This much is certain—that the nerves grew independent of the central nervous system; that they were in no connection with already formed nerves of the central nervous system, and, therefore, that they must have arisen from medullary corpuscles in essentially the same manner as other tissues.

Those who strictly adhere to the doctrine of exchuvances in embryology, depending upon the three original layers, will try in vain to explain such an independent formation of nerves in the middle of connective tissue.

DENTAL EDUCATION IN GERMANY.

BY W. D. MILLER, BERLIN.

In consideration of the recent awakening which has taken place on the subject of dental education and the praiseworthy efforts that are being made to raise the standard of dental requirements and the status of the dental profession, I readily acquiesce in the request of the editor of the *INDEPENDENT PRACTITIONER* to furnish some information on the subject of Dentistry and Dental Education in Germany. A comparison of the respective systems of education in different countries and the results accomplished by them must always be of interest and often of profit, particularly to those engaged in educational work, as well as to all those interested in the standing of the dental profession at home and abroad. It would not, however, be justifiable to say that the system of education which has produced the best results in Germany or England would likewise be best adapted to the need of the profession in America, or *vice versa*. The preparation of a dentist must, to a certain extent, be made to conform to the demands made upon him. I will return to this statement later on.

There are two very distinct classes of persons practicing dentistry in Germany: the Zahnärzte (tooth-doctors) and the Zahnkünstler (tooth-artists), or Zahntechniker (tooth-mechanics) or Zahnarbeiter (tooth-workmen), as some of the Zahnärzte insist upon calling them. The Zahnarzt occupies about the position of the dentist in America who has passed the dental examination imposed by a State board of examiners; I shall, however, use the term Zahnarzt untranslated, partly in order to avoid all confusion, and partly because every Zahnarzt is very proud of his title, and would feel deeply wronged to be styled dentist. I must confess that in this they cannot be blamed, as I myself do not allow the term dentist to appear in connection with my name, unless it is put there by some correspondent; not that I am ashamed of my profession, but that the title "American dentist" (or D. D. S.), through the unworthy action of some few of our regularly chartered dental colleges, has become one of such doubtful significance that I prefer not to have the accompanying suspicion attached to my name. I shall return to this question on another occasion.

The term *Zahntechniker* originally meant one who did mechanical work exclusively—mechanical dentist; now *Zahntechniker*, *Zahnkünstler*, etc., etc., are simply terms used by any one who chooses to employ them to signify that he is engaged in the practice of dentistry. Those who have not passed the State examination, and cannot therefore call themselves *Zahnärzte*, take any name which best suits their fancy, and practice what they please.

It is only since the year 1869 that the *Zahntechniker* have played a very prominent part in the history of German dentistry. Previous to that time, the practice was restricted by law to the *Zahnärzte*, that is, to certain persons who had fulfilled certain requirements, specified below, as to general and dental education, and had passed the examination in these subjects, imposed by the State.

In 1869 a law was enacted opening the practice of medicine and of dentistry to every one without reference to general or special education or fitness for the work. It naturally happened as a result of this condition of affairs, known as *Gewerbe-Freiheit* (literally, freedom of trade; in this case, freedom of practice), many turned their attention to dentistry who did not have the necessary preliminary education to admit them, either to the State dental examination, or to the study of dentistry at the University. These persons make up the class denominated *Zahnkünstler*, etc. In fact, any person who can master a few operations and a vulcanizer may call himself *Zahnkünstler*, and begin work on the first one whom he can induce to trust to his skill.

From this it must not, however, be imagined that all the good work in Germany is done by the *Zahnärzte* and the bad by the *Zahnkünstler*. There are many of the latter who do very good work, and the better class of *Zahnkünstler* is, practically, in advance of the poorer class of *Zahnärzte*; and not infrequently the *Zahnarzt* yields to the *Zahnkünstler* in the struggle for whatever. The *Zahnkünstler*, having been at much less expense of time and money than the *Zahnarzt*, and having begun practice earlier in life, also living usually at less expense, is able to do work at a lower (more reasonable?) price than the *Zahnarzt*, and if he is skilful, as many of them are, he naturally takes the lead of the *Zahnarzt*, especially in practice, among the lower classes, if we may not also say the middle classes, where the first question is, what does it cost? For this reason (as well as because this unlimited license of prac-

ting dentistry has done a great deal to hinder the progress of this specialty) the Zahnarzt has for many years waged a bitter war against the Zahnkünstler, for the purpose of restricting him by law in the practice of dentistry.

Persons of German nationality, who purpose making the career of a Zahnarzt, are obliged, first to acquire the Reife für Prima of a German gymnasium, or first-class Real Schule; that is, they are obliged to pursue their studies at the gymnasium until they have passed the examination admitting them to Prima. This is called the Vorbildung, and is equivalent to that required to enter the Sophomore class at Ann Arbor or Yale. Secondly, they must furnish evidence of having studied four semesters at a German University, and thirdly, a certificate given by some Zahnarzt of having had practical exercise in mechanical dentistry. Fourthly, they must pass the State dental examination, as described below.

The practical American reader will, no doubt, at once say that one may have fulfilled all these conditions and still know very little about dentistry, and this is the case. The preliminary education (Vorbildung) is what it pretends to be. No one can work his way up to Prima without having applied himself diligently for many years in the acquirement of general knowledge, more particularly of Greek and Latin. The second condition, however, appears remarkably insufficient, nothing whatever being specified as to what is to be studied, it being immaterial whether it is law, theology, medicine or natural sciences, etc.,* or the student may spend the whole of the four semesters in the Kneipe, it being necessary for him to appear only once at the beginning and once at the end of the semester to secure the necessary certificate of attendance.

A certificate of having had practical exercise in mechanical dentistry is often, as may be easily supposed, obtained for very little work. It follows that candidates for the State dental examination in Germany must have had a good general education, but need know very little about dentistry. It has more than once happened that persons bearing the title "Praktischer Zahnarzt" have come to the Berlin institute to continue their studies who have never made a gold filling or adjusted the rubber-dam. Consequently,

At some Universities this law is now being so interpreted as to require attendance at medical or dental lectures for at least three of the semesters.

while the average German Zahnarzt possesses a much better general education than the average American dentist, in the matter of dentistry itself the latter is far ahead. Of course there are exceptions on both sides. I here speak of averages. I may also promise what I shall discuss more fully farther on, that the Zahnärzte at present turned out by the Dental Institute of the University of Berlin, while having a better general education, are, I think, sorry, I had almost said quite, as well prepared to practice dentistry in all its branches as the average American graduate.

The State dental examination may be made at any university in Germany. The candidate is examined in (1) Anatomy, (2) Physiology, (3) Pathology, (4) General Surgery, (5) Special Surgery (of the head), (6) Materia Medica, (7) Toxicology, (8) Dentistry—operative, mechanical and scientific. These examinations are not always, however, all that they are supposed to be. At some universities they have been made notoriously easy, so much so that students at the Berlin Institute who, for any reason, generally lack of industry, are afraid to attempt the examination in Berlin, stay out the four semesters here and then go somewhere else to make their examinations. It consequently has often happened that candidates have passed the examinations knowing very little about medicine, and still less about dentistry. From this it will be seen that America is not the only country in which dental examinations may be easily made, and that there are Indian paths in Germany as well as in Philadelphia. Recent events, however, seem to indicate that the State dental examinations are being rendered more severe in other universities than Berlin.*

The manner in which the examinations are conducted I will describe in detail when I come to speak of the Dental Institute of the University of Berlin.

* In America and Germany the systems of dental education have, more recently, been more doctrinally opposed, the one requiring nothing but dentistry, more particularly practical dentistry, the other devoting many years to general education, and comparatively little just to dentistry itself. That both of these systems are not without their merits, and that of the two the American, as best fitting the need for the performance of his duties, is the better, is equally undoubted. A dentist should be, above all other things, skilful in dentistry, scientifically well grounded, and should never mistake his dental for a general education. Even, however, as we means to have of making dentists out of ignoramuses. What is most desirable is an amalgamation of the two systems, as we are trying to accomplish: those in Berlin are general education, required in Germany, followed by the practical education given in the best American colleges. This is, however, a broad question which I do not propose to discuss here.

As already stated, up to the year 1869, dentistry was practiced in Germany, with very few exceptions, by such persons only as had passed the examinations for and received the dental approbation. Some of the more successful Zahnärzte, however, employed as assistants in the mechanical laboratory persons who had not made the examination. These assistants received the name of "Techniker," and it is now claimed by the Zahntechniker that the reputation of many Zahnärzte was built up by the work of their Techniker alone.

In 1869, a law was enacted which opened the practice of medicine and dentistry to any and every one, entirely independent of ability or education. This condition of affairs (called the Gewerbe-Freiheit) made it possible for the Techniker to establish himself independently in practice, and they were not slow in taking advantage of the opportunity, as the present figures will show. In 1869 there were, in Berlin, some fifty Zahnärzte, and half a dozen Zahntechniker. In 1887 there are about sixty Zahnärzte, and not much under 200 Zahntechniker.

There appears, also, to be little doubt that the freedom to practice dentistry was and is employed to a very undesirable extent. Any one who had anywhere picked up the least smattering of dentistry, not only the regular Techniker from the mechanical laboratories, but servants, barbers, anybody could begin at any time to work on the human teeth. Not being allowed to call themselves Zahnärzte, they made use of all kinds of titles, such as Zahntechniker, Zahnkünstler, Zahnartist, Dentist, Dentiste, Lehrer der Zahnheilkunde, Zahnopérateur, Specialist für Zahnheilkunde, etc., etc., and proposed to perform all kinds of operations on the human teeth, not only the insertion of artificial teeth, but filling, extracting, etc., etc. Naturally the Zahnärzte were highly dissatisfied with this state of things, partly because of the havoc made in their practices by so many tooth-artists, and partly because the standing of the whole dental profession in Germany suffered, the public not being able to distinguish between the Zahnarzt and the Zahnartist. Thus originated the struggle between the Zahnärzte and the Zahnkünstler, which seems to gradually increase in intensity. The object of the Zahnärzte is to limit the Zahnkünstler in the practice of dentistry, or at least to compel them to drop the title Zahntechniker, unless they are able to fulfill certain conditions yet to be determined,

while the Zahntechniker attribute the whole movement to *jalousie de métier* on the part of the Zahnärzte, and are putting forth all their strength to maintain their present rights, usually making a very good showing at exhibitions in mechanical and operative work, anatomical and microscopic preparations, etc., etc. They have also established night schools, and among their teachers have numbered no less a person than Robert Hartmann, professor of anatomy in Berlin. These educational attempts are considered by the Zahnärzte as only a blind to keep off adverse legislation.

I have been asked whether it is true that there are cities in Germany of 10,000 inhabitants with only one Zahnarzt. Yes, there are cities of 45,000 inhabitants with only one Zahnarzt; there are many places of 10,000 to 15,000 inhabitants with no Zahnarzt whatever, and I have been told of a city of 40,000 inhabitants, near Essen with no Zahnarzt and only one Zahntechniker. Here it is not at all unfrequent for people to travel two to ten hours by rail to go to their dentist. In those places having neither Zahnarzt nor Techniker, the extractions are performed by physicians, barbers, etc.

The organizations in Germany are pretty much the same as in America. There exists (1) a National Dental Society (Central Verein Deutscher Zahnärzte), meeting once a year at some place chosen at the previous meeting, and having active, honorary and corresponding members. Nearly every province has its local society; for example, Verein für Rheinland und Westphalen, Verein Schleswig-Holsteiner Zahnärzte, etc., etc. Berlin has two local societies; the older one, Die Berliner Zahnärztliche Gesellschaft, and the younger one, Der Verein Deutscher Zahnärzte, the avowed object of the latter being to fight the Zahnkünstler and the American dentists. There is also, of recent origin, a society of German dentists holding only the degree D. D. S., called "Der Verein der in Amerika gebildeten Doktoren der Zahnheilkunde." The following journals are published:

- | | |
|--|--------------------------------|
| (1) Zahnärztliches Wochenblatt | Editor, Zahnarzt Dr. K. Löwe. |
| (2) Deutsche Monatsschrift für Zahnheilkunde | — — — — — Fehreide. |
| (3) Correspondenz Blatt für Zahnärzte | — — — — — C. Ash & Sons. |
| (4) Journal für Zahnheilkunde | — — — — — E. Müller; D. D. S. |
| (5) Zahntechnische Reform | — — — — — Zahnkünstler, Dents. |
| (6) Monatsschrift des Vereins Deutscher Zahnkünstler | Editor, Zahnkünstler Pölscher. |

PERSONAL RECOLLECTIONS OF A DENTIST OF THE EARLY DAYS.

BY DR. L. W. BRISTOL, LOCKPORT, N. Y.

READ BEFORE THE JOINT MEETING OF THE SIXTH, SEVENTH AND EIGHTH DISTRICT
DENTAL SOCIETIES AT BUFFALO, N. Y.

In the year 1850, I took charge of the office of Dr. Geo. E. Hayes, Buffalo, when he, his brother, Mr. Hayden and Dr. McBeth went across the plains to California. One morning, very early, there came to the office a richly dressed lady very much excited. She handed me a parcel, and said: "Just look at those teeth; I paid an infernal scoundrel \$50 for a gold plate and they are nothing but silver, and poor silver at that." I asked her who made them. She replied, Dr. R. G. Snow. Certainly they did not look very glittering. I knew that Dr. Snow would not do a dishonest piece of work, and suspected something wrong. I stepped into the laboratory, took up a scraper, and found the plate was good gold. I asked her what she had been doing to them. She replied, nothing, except to clean them. I asked her how she cleaned them. She answered that she had put them in a tin basin with wood ashes and water, and boiled them; I asked her if the basin was clean. She said it was a bran new one, never used before, and all the gold coating had boiled off. "Now," said I, "my good woman, this is good gold plate; you have simply tinned them over. Take them back to Dr. Snow, tell him what you have done, that you came to me and I told you what was the matter, and he will take off the tinning in a short time." She brightened up and said she had always had great respect for Dr. Snow; he had always done their dentistry and she was very glad to find him still worthy of her confidence. At noon the doctor came in laughing. "That was rather a queer case you had this morning," said he; "I am very much obliged to you for the professional courtesy shown, and I shall not forget it. It is the first of the kind in all my practice."

Dr. Hayes was at that time rather exclusive. He possessed, as he thought, some valuable secrets in practice. When he went away, he drew up a power of attorney and left it in the hands of his lawyer, Tillinghast, for his wife to use in case of necessity. The doctor's first wife was a little more on the close communion order, if possible, than the doctor himself. She had seen Dr. Harvey, Dr.

Brown, and now Dr. Snow at the office. She sniffed danger to Dr. Hayes' great secrets, and came to me and said: "I observe several city dentists at the office and I do not like it; I hope you will not let them look around here. Dr. Hayes would not be pleased at that." I replied, "Mrs. Hayes, if you think Dr. Hayes' methods and secrets are in danger, you had better use your power of attorney, and I will step out. The cholera is depopulating Buffalo, business is almost suspended, the doctor's brother and Mr. Hayden have died of it at Fort Laramie, and I think the doctor himself will turn back. You talk of fleeing with your family to the Ontario hills. Now you can save all the office secrets by using your power of attorney. If you do not choose to do this, I want you to attend to your own business and I will attend to mine; I want no more of this espionage. You send in the servant girl daily to set and watch what is said and done, and I will have no more of it. Now see your attorney and do what you think the best for Dr. Hayes' interest." She replied that she did not wish to do that, and bothered me no more.

In the year following, when I had returned to my office in Lockport, I had an experience similar to that of Dr. Snow. I had made an upper full denture on gold plate for a lady from Canada. About three months subsequently she called at my office and handed me a parcel carefully rolled up in paper, remarking: "I did not think that of you. Our family has always employed you, and thought you an honorable man and dentist, but I have found you out to be a cheat and a rascal." I unrolled the parcel and found her set of teeth looking like anything but gold. I asked her what she had been doing with them. She replied, "Nothing but scouring off the gold wash you put on." I asked her what she had been scouring them with; what kind of scouring preparation she had used. She answered that it was polishing powder that she had bought of a peddler. She was cleaning up her silverware, and thought she would give her teeth a touch, but found it took off all the "gold-vening" that had been put on, and the teeth tasted so bad that she could not wear them." I asked her if it was called "Bump's Polishing Powder." She said that was the name of it. "Well," said I, "that contains mercury and cyanide of potassium and is poison. I should have thought it would have made your mouth sore." "Oh, it did," she said, "and it is sore now." "Well," I replied, "my dear woman,

you had better save your breath and anger; I am the one who should be offended. Did you not know better than to scour your good gold plate teeth with a miserable tramp's door-knob polish? Come in my laboratory and have a seat, and I will prove to your satisfaction that this is a good gold plate. Now you watch me and see that I do not put on a gold wash." I put them in the lead dish, and poured on acid and water and boiled them, then took them to the sand bath and boiled them in soda and polished them with the brush-wheel, she watching me closely. I handed her the teeth, and she sat down and had a good crying spell over the hard things she had said of me. I gave her a good dinner and my blessing, and she departed. About two weeks after I received a letter in which she said: "I shall never hear the last from my friends and family about going clear to Lockport to have the 'Bump' taken off my teeth."

In 1849, I made a plate with five teeth on a gold base for Mrs. P. She had worn them about three months, when one night, not feeling well, she took them out and laid them on her dressing table. When she made her toilet in the morning, her teeth were missing. She ransacked the room and house thoroughly, but could not find the teeth. It was a great mystery what had become of them. She finely accused the servant girl, Jane, who had been in the family two years, of stealing them and trading them off with a peddler for old gold. The girl indignantly denied the theft and left, and got revenge by marrying a very respectable young man, and in the course of a year presenting him with a fine bouncing boy. Three years after the above occurrence, Mr. P. concluded to make some alterations in his house, and in tearing away a partition at the head of the bed, between the mop-board and the clapboards, there lay the "stolen teeth." A mouse had dragged them there. I had made Mrs. P. another set, and reflected that it was an ill wind that blew no good. Mrs. P. took the teeth and came to my office. She told me how she found them, and was feeling very badly and asked me what she should do. I told her to go and tell Jane and apologize. She said she was ashamed, but finally agreed on condition that I would go with her. I did go, told Jane that Mrs. P. had found her teeth, and how, and had now come to apologize for the wrong she had laid at her door. Well, they shook hands, and cried, first one and then the other, and then both together. I had

the satisfaction of witnessing a circus without a clown, a good crying bee of two women until both were exhausted. Mrs. P. asked me if it was not awful that for three years she had accused Jane of stealing, and what I thought of the whole affair. My reply was, "Good moves in a mysterious way." I left them both crying. How long the spell lasted I do not know, but I concluded that Burns was right when he said that the ways of men and women and mice "gang aft a-glee."

I wish I could disabuse the public mind in regard to the practice of dentistry—that it is such an easy and lucrative profession. I have received on the average about one application a month from would-be students, whose parents or friends would say that he was not very strong, and his health was poor. I invariably answer such, "If your son or nephew has poor health, the profession of dentistry is the last business he should engage in." Only about one-third of those who enter upon dental practice ever successfully follow it for a living. From the time the dentist enters his office he has not only his own nervous system, already severely taxed, to care for, but the very worst side of his patient also, and that is not a very desirable condition for ten hours of each day. A dentist who is skilled and ambitious, and who applies himself closely to the operating chair or laboratory, lasts about five years. At the end of that time he is ready to retire and try to recover his broken health. His eye, brain, stomach, lung or liver has given out, and he must spend about all he has accumulated for medical services, or for change of air in trying to regain his health. I have been there and know how it is. For six years I worked, ate and slept under the same roof, wore a pair of office slippers, and was not a hundred yards from my office. At the end of that time I was a nose-up man. I doctored with allopath, homeopath and towpath, but got no relief. One day a professor from Goddes, near Syracuse, called on me, and said: "Why, young man, you do not look as well as you used to; I will bet you are taking all kinds of medicine. What are you trying now?" I produced from one pocket a box of Wright's Indian Vegetable pills, from another a lot of Dover's powders, from another a box of quinine, and from another a bottle of an iron mixture, and when I had emptied myself the table was about full. The Goddes philosopher gathered them all up, walked to the door and threw them into the street, saying that it was a pity to waste so much medicine, but

he guessed that was the best place for it. He asked me if I had a fishpole. I said no! A gun. No! A horse. No! "Well," said he, "the first thing you do, go and get all three. Quit the office, go fishing or hunting, and into the woods, sleep on the hemlock and cedar boughs, rough it, and quit taking medicine; that is the only thing that will save your life; if you think your life worth saving, get into the open air."

Well, December came, and I joined a party of hunters and left for the old primeval woods in Canada. We arrived at a shanty in the backwoods, hired a guide and got ready for the first day's hunt. It commenced to rain, and this formed a crust on the snow. The guide said that it was a capital day for hunting, and he sent one to one place and another to another. I started out in the rainy, misty day, tramped about until two P. M., on the track of a deer, got lost, having no compass, came out on an old timber road, found a negro driving two yoke of oxen drawing a stick of timber, who was going in the direction of our shanty. We came to a clearing, when the negro saw an ox jump out and put off from the inclosure. He asked me to take his whip and keep the team in the road and he would head off the ox. I took his whip and jogged along, but I got a little too near the forward team, and the nigh ox did not like a white Yankee driver, and gave me a kick, landing me in the ditch. I got up and proceeded to teach that ox better manners. The team turned off into the gutter and upset the log. Just then the negro returned and gave me a good cursing, and I put out for the shanty. Well, here was my first day of roughing it. I had got lost, got hungry, got wet, got kicked by an ox and cursed by a negro. I expected to be dead in the morning, but got something to eat, rolled up in my Macinac blanket, went to my hemlock couch and slept the tired sleep of my first day's hunt. In the morning I was alive, had no cold, and for the first time in months had an appetite for breakfast, and did what I had not done in a year, ate a hearty meal. I spent two weeks in the wilderness, and when I returned to Lockport my friends hardly recognized me, my health and strength were so much improved.

I have but one piece of advice for you young sprouts just beginning practice. Success is what we all wish, and money we are all crazy for; but if you secure them at the price of health and life, you will make the worst bargain you ever made.

CLINIC OF PROFESSOR GARRETSON, HOSPITAL OF ORAL SURGERY,
PHILADELPHIA.

REPORTED BY ROBERT S. IVY, D. D. S.

The clinical service of the Hospital of Oral Surgery was never so full and instructive as at present, seldom less than three hours at a time being required to get through the variety of cases which are presented. The clinic deals with many of the most intricate and complicated performances in surgery, and as a school for study it is one of the best attended and most popular of the hospital services of Philadelphia. Few surgeons have made more operations as to number or more complicated as to performances than has Professor Garretson, and his record of success remains unbroken. Dr. Garretson shows himself something of a fatalist, inasmuch as he never attempts any of his great operations without having at his right hand his chief of the oral clinic, Dr. M. H. Cryer. The two work together as one person, and in moments of danger are recognized as speaking pages to each other by a single look; this is, presumably, the result of their many years of relation.

Dr. Shumwell, chief of Professor Garretson's General Surgical Staff, is another right hand at the clinics, and is never anywhere but in the proper place at moments of emergency.

The anæsthetic exhibitions at this clinic are necessarily without parallel, by reason of the nature of the operations. Those are in charge of Professor Dove, and it is no uncommon thing to see an effect, carried and continued to the point of deadness as to external impressions, produced and continued for one or two hours, while all the time care is required to see that the blood from the operation shall not smother the patient.

Amongst the operations recently performed were the following:

Case I. Removal of a tumor occupying a position beneath the carotid artery, consequently overlaid by the vessels contained in the sheath, the sterno-cleido mastoid muscle, the external jugular vein and the integuments.

Case II. Neuralgia in the region of the distribution of the inferior maxillary nerve. The lower portion of the inferior dental branch had been removed on a previous occasion, but the pain still continuing, it was proposed to cut the main branch of the inferior

maxillary nerve at the point of its egress from the calvarium, a performance attended by numerous complications, the part being environed by many important vessels and organs. The procedure consisted, first in making an opening through the tissues overlying the perpendicular part of the inferior maxilla, cutting the attachment of the masseter muscle at its insertion and turning it up over the temporal region, thus exposing the greater portion of the external surface of the ramus of the jaw. In making this incision precaution was taken to avoid cutting the duct of steno. The anterior portion of the ramus was next removed, a circular saw revolved by the surgical engine being the instrument employed. The cut being made downwards from the middle of the sigmoid notch to a point opposite the wisdom tooth, thence across the lower third of the bone, the section removed included the coronoid process. In making this cut, a portion of the internal pterygoid muscle was divided, also the temporal muscle at the point of insertion. An incision through the lower head of the external pterygoid muscle next exposed the zygomatic fossa, in which were found the upper portions of the gustatory and inferior dental nerves at their point of division from the main trunk, also the internal maxillary artery and its branches of this region; a portion of the parotid gland was also exposed. The nerve, having been isolated from its surroundings, was cut at its exit through the foramen ovale. Hemorrhage being controlled, the wound was dressed and the patient removed to the ward.

Case III. Ex-section of inferior dental nerve. This operation, on account of its important successful results, is of the most frequent occurrence in this clinic. Its manner is original with Professor Garretson, and consists in making an incision below the lower border of the inferior maxilla, and dissecting away the tissues overlying the bone on its external surface, as far forward as the anterior or mental foramen, in which the facial artery is generally cut and ligated. The next procedure is to remove the outer wall of the canal by means of bur and engine, and to divide the nerve as far back as is necessary, the time required for the operation being only a few minutes. In the case under notice the patient had suffered severe pain in the region of this nerve, the cause being found in a series of neuromata on the main trunk within the canal. One week sufficed to show the patient to the class, completely cured.

Reports of Society Meetings.**AMERICAN DENTAL ASSOCIATION****TWENTY-SEVENTH ANNUAL MEETING.****REPORTED FOR THE INDEPENDENT PRACTITIONER****CONCLUDED FROM PAGE 641, VOL. VIII.****THURSDAY EVENING SESSION.**

A resolution was adopted setting aside one thousand dollars as a special fund, to be under the control of the Executive Committee and held for the protection of dentists against the unlawful demands of the possessors of dental patents.

Section VII was called—Anatomy, Pathology and Surgery—and the report was read by the Chairman, Dr. T. W. Brophy. A paper by Dr. Atkinson upon "Sponge Grafting" was offered, and the subject of Implantation recommended for discussion.

Dr. Atkinson's paper was read by Dr. Rhein. The sponge graft, it asserted, is primarily adapted to the reproduction of tissue lost traumatically, or when there is no inflammation. The author had never seen a failure to unite by first intention. The final disposition of the sponge is still an open question.

His first case was three years ago, the external plate of the alveolus being lost, an extensive fistula existing. This was enlarged by tents, the carious portion of the bone burred out and the cavity washed with aromatic sulphuric acid and with styptic colloid, and treated to a spray of mercuric chloride. Then for three days the cavity was dressed with a sterilized dressing. The fourth day a piece of sterilized sponge a little larger than the chasm was prepared by placing it in a glass and pouring a solution of warm mercuric chloride upon it. It was wrung out and carefully inserted. The next day there was a slight effusion of serum which was removed by bibulous paper. The next day there were indications of blood in the graft. Two days subsequently the trabeculae were filling up. At the next visit there were indications of pus where the sponge was not adherent. The parts which had not adhered were clipped out until the vascular part was reached, when it was sprayed with mercuric chloride. After a week there was another indication of pus manifest.

This was treated as before, when a scab formed, and it is now indistinguishable from the rest. This was a fair average case. The sterilization of the sponge is accomplished by heating it in mercuric chloride to 120° F. At least three times per day the case should be sprayed with the mercuric chloride.

Dr. Rhein—Said that he had been employing the sponge-graft with unvarying success. It will reproduce every kind of tissue, but the territory into which it is introduced must be in healthy condition. This is essential to success.

Dr. Morrison—Eleven years ago I presented a paper upon the re-planting of teeth. One of the cases cited was exhibited to Dr. Younger last fall. Odontoclasts had once been at work, but preventive measures had kept the tooth until the present time. Daily friction on the root had cured the angry symptoms. He had not as much faith in the implantation of old teeth as of those freshly extracted, but Dr. Younger has, and this encouraged him to make trials.

Dr. Harroun—Had replanted a tooth that had been out for eight weeks. He was obliged to open up the socket, which was easily done with a twist drill, and the tooth was now giving good satisfaction.

Section I—Prosthetic Dentistry, Metallurgy and Chemistry—was called. The Chairman, Dr. Harroun, said there was no report, as the Secretary was not present and had sent nothing. He presented, however, a few subjects for discussion.

The subject of chemistry is too much neglected. We have few chemists, and what we have are not very active. Metallurgy has retrograded since the advent of rubber. We are below the standard of twenty-five years ago. Few of our leading men do anything in the laboratory, sending their work out to men who have no knowledge of the peculiar demands of the case. Crown and bridge-work is making advances, and there is no doubt it will fulfill a useful purpose in the hands of competent men. Aluminum gives promise of great usefulness. Dr. Carroll, of Meadville, Pa., has apparently overcome many of the obstacles to its general use. Metallic linings to vegetable plates present advantages in point of cleanliness, but they cannot take the place of metal plates.

Dr. Hunt—Said that heretofore aluminum had been impracticable in dentistry. It could not be satisfactorily soldered, nor had any method of casting it been a practical success. But to-day the

Association had seen true scientific work done in a clinic. It has been proved that all that is necessary is to keep the surfaces entirely clean when, under the influence of heat, they will unite. Its manipulation seems almost as easy as that of rubber. A little more experience and we shall be possessed of a metal that can be readily worked by any dentist. The demonstration of Dr. Carroll had delighted him, and he believed that it was the greatest advance in mechanical dentistry that this generation of dentists had seen.

It was moved and carried that the appropriation for sectional work be the same as last year.

It was moved and carried that Section II be directed to report at the next meeting a plan for a course of elementary instruction in Dental Histology, Anatomy and Hygiene, in the public schools.

The officers for the ensuing year were then installed. A vote of thanks to the retiring President for the dignity and ability which he had exhibited in the fulfillment of his duties was passed, and to Dr. S. A. Freeman for his untiring labors as chairman of the local Committee of Arrangements.

President Abbott appointed Drs. E. T. Darby and A. W. Harlan members of the Publication Committee, and Drs. W. W. Walker, M. W. Foster and T. T. Moore, members of the local Committee of Arrangements.

The Association then adjourned to meet in Louisville, Ky., in joint session with the Southern Dental Association, on the first Tuesday of August, 1888.

NINTH INTERNATIONAL MEDICAL CONGRESS, WASHINGTON, D. C.,
SEPTEMBER, 1887.

SECTION XVIII, DENTAL AND ORAL SURGERY.

REPORTED FOR THE INDEPENDENT PRACTITIONER, BY "MRS. M. W. J."

CONTINUED FROM PAGE 647, VOL. VIII.

WEDNESDAY MORNING SESSION.

The opening paper was from Dr. Pradère de Moine, Lyons, France, entitled, "La Phthisie Vaincue par la Permanence des Medicaments aux Milieu du Palais." (Phthisis Cured by the Continuous Application of Medicaments to the Palate).

A translation of portions only of the paper was read by the Secretary.

After a brief discussion, it was voted to refer the paper to the Section of Practical Medicine, as not coming within the sphere of the dental practitioner.

Dr. J. Von Metnitz, of Vienna, Austria, read a paper, entitled "Osteo Myelitis."

He said that inflammation of the medullary substance of the maxillaries was seldom met with outside of the hospitals, where it was probably aggravated by uncleanness on the part of the patient. The original causes in these cases were not easily discovered. Dr. Metnitz then described two cases, in both of which the patient died. One was that of a man of forty-three years of age, for whom a number of teeth had been extracted. He was soon after taken with high fever; on the fifth day he was delirious; on the seventh day he was taken to the hospital. The stench was then intolerable, the left cheek and temporal region greatly swollen, the eye-ball distended and the jaws set. He died the next day. Examination showed both upper and lower alveoli empty, with the exception of the remains of the third molar with a socket six millimeters deep. There was necrosed bone in all directions, and the articulation was entirely destroyed. In the second case, a patient of seventeen years old, there was chronic inflammation of the lower maxilla, the periosteum was destroyed and there was no nutrition of the parts.

Dr. M. L. Rhein, of New York, opened the discussion of this paper. He thought the free use of the bur in removing all infiltrated bone would often produce beneficial results, if we go beyond the line of infiltration.

Dr. G. J. Friedrichs, of New Orleans, thought the opinion of the author of the paper, as to treatment, worth nothing, as both patients died. He had had no experience in cases causing death, but thought it might sometimes be necessary to excise the entire lower maxilla to effect a cure.

The paper passed without further discussion.

Dr. M. G. Jenison, of Minneapolis, read a paper, entitled "Art in Dentistry."

He said that the perfection of talent lay in the application of the principles of art to practice, for which dentistry opens the widest field. In restoring teeth to beauty and usefulness it must be borne

in mind that there was a definite purpose in every line, in every form, in every surface; to mar or to cut away anything is to destroy that purpose. A very slight loss will change both articulation and expression of features. The profile of Apollo is the type of physical beauty, but the slightest modification of any feature would detract materially from that beauty. The face of a patient must be made the subject of careful study. The play of the muscles of the mouth must be watched, when open, when closed, when in full action, when in repose. In the arrangement of the teeth there are great opportunities; the teeth should be selected with reference to both temperament and age; gum sections afford no scope for originality.

The discussion of this paper was opened by Dr. John Allen, of New York. He spoke of the antiquity of dental operations, as shown in the tombs of prehistoric races, in Egyptian mummies, in the works of Greek and Latin poets, of medical authors from Galen down; but it is only in the present century that elaborate works on dentistry have been published, and that we have dental journals, dental colleges, dental associations. With these facilities dentistry now stands higher than ever before; yet there are greater heights to be attained, especially in the prosthetic department. Dr. Allen disclaimed the term "mechanical dentistry." The restoration of form and feature, of expression to the mouth and face, is not mechanical work; it is art, and required the highest degree of artistic skill. A certain degree of knowledge can be acquired through books, but for the higher practical points a man must depend on his own individual powers of conception. Such efforts are the means of advancing dental science. The knowledge that is conquered by labor is truly our own. Through individual efforts our profession will advance, nourished by the dew of wisdom, warmed by the sun of science.

The subject was passed without further discussion.

WEDNESDAY AFTERNOON SESSION.

The session was held in the National Theatre, which was darkened to allow of stereopticon illustrations of a paper on "The Origin of the Dental Fibril," by Dr. R. R. Andrews, of Cambridge, Mass., and one on "Protective Denture, or Denture of Repair," by Dr. M. H. Fletcher, of Cincinnati, Ohio.

There was also an exhibit of Photo-Micrographs, by Dr. J. Howard Mummery, of London, England. (The auditorium being darkened, only very inadequate notes could be taken by the reporter.)

Dr. Andrews spoke of the different processes adopted by different investigators in their efforts to get at the exact structure and the minute details of the process of dentification. When it is possible to work nearer life we may hope to reach more satisfactory results. The specimens used by Dr. Andrews were taken from the embryo, at about the time of birth, and immersed in a preparation of osmic acid, which was changed daily for two or three days. Instead of immersing them in alcohol, they are dried on bibulous paper and then placed in melted paraffine or lard, which is left to cool. Very thin sections can be cut, and we work as near life as is possible with our present knowledge.

The illustrations thrown upon the screen were guaranteed by the author to be actual reproductions of tissue, not a line having been added to carry out a theory, and all the work done by himself, from the selection of specimens to mounting the photo-slides.

The successive illustrations showed the gradual development of the tooth from the first dipping down of a line of epithelium (from the jaw of an embryo pig two inches in length), through its enlargement and change to flask-shape; the formed papilla below the enamel-cap, gradually assuming the tooth shape, with the permanent tooth-germ budding from the side; the growth of the pulp within the dental sacculus, and the cement organ; the beginning of calcification with the odontoblasts, and fibrils forming. The author laid great stress on the difference in outline of the square abrupt-edged dentine cells, and the fibril-cells in elongated pear-shape, with fibrils drawn out when broken off in cutting the sections. The last of the series was a section through the jaw bone showing all the tissues, dentine and enamel, with wavy lines showing anastomosis between the two.

Dr. Frank Abbott, of New York, opened the discussion of Dr. Andrews' paper.

He said that the stereopticon views so far exceeded his anticipations that he hardly knew what to say. The profession owed Dr. Andrews a great debt for the patience, earnestness and intelligence with which he had worked for the advancement of his brethren. He must, however, differ from his view of the origin of the dental

fibril. The papilla is a mass of myxomatous tissue, liberally supplied with medullary elements. The medullary corpuscles condense and form the odontoblasts about the same time that the enamel organ is observed forming the enamel-cap upon the papilla. The odontoblasts, when viewed under high power, show a delicate reticulum, which unites the nuclei with the walls of each corpuscle and with each other. This reticulum, as well as the walls of the odontoblasts, is the living matter which remains as the living portion of the dentine. As the calcareous basis-substance is deposited, a certain territory of the papilla becomes dentine, another row of odontoblasts making its appearance, from the ends and sides of which prolongations of the living matter may be seen running into the canaliculi of the dentine already formed. The pear-shaped odontoblast gives off one, while the broad or square shapes may give off several prolongations. If only the pear-shaped odontoblasts gave off the fibrils, territories of considerable size would be left in the dentine with no canaliculi, or any provision for furnishing these territories with living tissue. To account for the origin of the dental fibril, it is not necessary to have any special shaped cells wedged in between the others.

Dr. M. H. Fletcher, of Cincinnati, Ohio, gave a series of stereopticon views of "Protective Dentine, or Dentine of Repair," dentine thrown out by the pulp to protect itself from external injuries or from exposure. It differs from normal dentine in being more horny or translucent, and in the comparative irregularity of the tubuli. It is often yellow or brown in color; it is built up more rapidly than normal dentine, and is also softer. It is due to some disturbance of the pulp, through the fibrils, stimulating it to abnormal efforts. The pulp sometimes dies, exhausted through its own efforts, leaving unoccupied space, or the pulp is so contracted that it dies from that cause, or pulp nodules may be formed. There is seldom complete calcification of the pulp-chamber, as the pulp must have room in which to perform its functions. With the death of the pulp, putrid matter forms an abscess.

The views exhibited the process of formation of protective dentine in cases of abrasion, in cavities of decay approaching the pulp-chamber, pulp nodules, deposits on the cementum, roots of teeth cemented together, etc.

The discussion of this paper was opened by Dr. W. X. Salter.

He said that this secondary dentine was developed by odontoblasts retained for that purpose, remaining quiescent on the surface of the pulp, but which, when necessary, are stimulated to renewal of function.

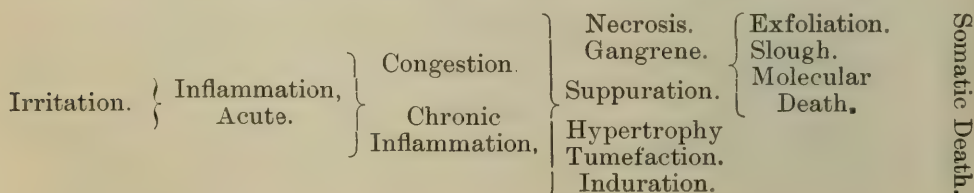
Dr. Sudduth said that Dr. Andrews had laid great stress on the form of the fibril-producing odontoblasts—the pear-shaped cells—but though his illustrations were the finest seen, they showed more than he himself saw, for though some were spindle-shaped, some square, some curved, there were fibrils projecting from all alike, and from two to half a dozen from some. If the odontoblasts are crowded they may be triangular or wedge-shape. Stress should be laid on function, not on form.

Dr. J. Howard Mummary, of London, England, exhibited a series of “Photo-Micrographs of Tooth Structure,” explaining his method of producing them, and the mode of bringing out the colors, etc.

Dr. Taft congratulated the members on the rich feast they had enjoyed.

THURSDAY MORNING SESSION.

Dr. L. C. Ingersoll, of Keokuk, Iowa, read a paper entitled “Inflammatory Processes,” and not “Inflammation of the Oral Tissues,” as announced on the programme. He would not treat of the etiology or bacteriology of inflammation, but only of its pathology, as being the most important feature to the dentist, causing much of the suffering they are called upon to relieve. In every case of inflammation of the tissues there is something in the environment which is not in harmony, and which causes a deviation from the physiological to the abnormal, causing a reversion or retrograde action. In all nature we see the operation of dual forces; in electricity we call it attraction and repulsion; in physics it is the positive and negative; so abnormal physiology is pathology. The processes of inflammation were given in diagram, as follows:



Dr. Ingersoll read only portions of his paper. Passing over the first stage, irritation, he dwelt somewhat at length upon acute inflammation and congestion, the short, quick route to death of the tissues, chronic inflammation being the longer road, or "main line," with "stop-over stations," as hypertrophy, or tumefaction, or induration. Congestion, he said, was the most alarming feature or stage of inflammation, being next door to death of the tissues, through necrosis, gangrene, suppuration—necrosis ending in exfoliation, gangrene in slough, suppuration being molecular death. An illustration showed the result of congestion in lessened vascular action, impaired flow of blood, with the massed red corpuscles clogging up the canal, the white corpuscles imbedded in the walls and percolating into the surrounding tissues, red corpuscles following, the debris constituting pus. As this work of destruction goes on, a work of reconstruction is also instituted, the leucocytes when breaking through walls meeting hordes of embryonic tissue-cells at work repairing; but for this work of construction going on simultaneously, speedy death would intervene; an alveolar abscess would mean, not merely swelling and pain, but would be a death stroke. Inflammation in cancellous bone and in dentine he described as similar processes, the swelling of the medullary tissue being at the expense of the cervical walls of the canaliculi or tubuli, which are thus softened and broken down. When dentine is keenly sensitive it is evidence of inflammation of the dentinal fibrils communicating with the pulp. Another illustration showed the pulp as a central organ with radiating processes—a nerve-centre, which should be called the dental ganglion; the pulp being an inert homogeneous mass, we might as well call the brain the cranial pulp.

The discussion of this paper was assigned to Dr. A. O. Rawls, of Lexington Kentucky, who characterized the paper as a *résumé* of what is contained in books, many portions being almost taken verbatim from Connheim and Stricker. He did not think that Dr. Ingersoll's view of the part taken by embryonic tissue-cells in connection with leucocytes would be sustained. He thought Dr. Ingersoll's illustration of a pulp-tumor rather than of fungous growth. Sensitive dentine he considered the result of a hyperemic condition of the fluids of the tooth-packing into the tubules an additional amount of fluid, the increased flow of blood creating a congested condition; but there was no inherent sensitiveness. Pressure of

the pulp gives pain through compression, not through any inherent sensitiveness of the pulp or of the fibrils; if pressed laterally, where it can give way, the pressure does not cause pain. Dentine, also, is broken down and absorbed under compression, with rapid flow of the watery parts of the blood in the tubuli, but not because of any special inflammatory action in the tooth.

Dr. Fletcher, of Cincinnati, related some experiments with electricity on the mesentery of a frog. The leucocytes gathered along the edge of the capillaries till they were completely occluded, when migration began; turning on the Farradic current, their course was changed; those that were passing through died *en route* and circulation was re-established, seeming to show that the life of the corpuscle is affected by electricity or other irritating applications.

After some further discussion of the paper by Drs. Storey, of Texas, and Rhein, of New York, Dr. Ingersoll appealed to the judgment of the Section after reading the entire paper when published, just criticism being impossible from the scattered fragments he had read.

Dr. C. L. Goddard, of San Francisco, Cal., read a paper, entitled "Pain in the Temporo-Maxillary Joints, Caused by Irregularity of the Teeth." This was the record of a case in which the patient suffered severe pain during mastication, even of a crust of bread, but not at other times. An impacted *dens sapientiæ* was at first suspected, but they were found all in place. Examination showed that the inferior maxilla was much longer than the other. The mucous membrane was in normal condition, with no tenderness to pressure anywhere. Examination of the articulation showed that when the jaws closed normally, only the cutting edges of the incisors articulated, the bicuspid and molars not antagonizing by one-sixteenth of an inch. In mastication it was necessary to protrude the inferior incisors beyond the superior to articulate the bicuspid and molars. Dr. Goddard, being convinced that the pain was due to the continuous strain on the muscles and ligaments, experimented on himself, showing that a great effort was necessary to bite hard with the jaw protruding. It was, therefore, necessary to change the articulation and allow of normal articulation. This was effected by means of a Coffin split-plate, and in a few weeks the superior incisors closed over the inferior, and normal articulation was secured, curing the long-standing pain.

There was no discussion of this paper.

Dr. E. S. Chisholm, of Tuscaloosa, Ala., read by title a paper on "Influence of Weather Changes on the Human Organism." He said that he regretted that time did not permit the reading of his paper, as he was convinced the subject was one of great practical importance, and one in which Government aid and coöperation were desirable.

His views on the subject were the results of fifteen years' daily observation of the effects of the variations of atmospheric pressure on the human organism, its tissues and nerves. As a practical point, he could foretell almost unfailingly from the mercurial barometer the general class of dental suffering he will meet during the day.

President Taft said that for six or eight years he had carried a barometer, having commenced observations at the suggestion of Dr. Chisholm, and could testify to the value of his views, and regretted that the paper could not be heard.

(TO BE CONTINUED.)

SOUTHERN DENTAL ASSOCIATION.

SINETEENTH ANNUAL SESSION AT OLD POINT COMFORT, VA., 1887.

REPORTED FOR THE INDEPENDENT PRACTITIONER BY "MRS. M. W. J."

CONCLUDED FROM PAGE 659, VOL. VIII.

THURSDAY EVENING SESSION—CONTINUED.

Prof. J. B. Hodgkins, Chairman of the Committee on Memorial, presented a report and resolution in memory of the late Dr. J. R. Walker, of New Orleans. After briefly sketching his honorable professional life, the report closed with the following:

Resolved, That this Association express its deep regret at the death of its late fellow-worker, Dr. J. R. Walker; its profound sympathy for his widow and children, and a determination that the fruits of the seed he planted with us shall have a rich harvest in the prosperity of this Association.

Resolved, That a page of the minute-book be inscribed to his memory, and that a copy of these resolutions be sent to his widow and children.

The resolutions were unanimously adopted.

Resolutions of thanks were tendered the Virginia State Dental Society for their generous hospitality; to the S. S. White Company for facilities for clinics; to the Executive Committee for the admirable arrangements made for the meeting; to the proprietor of the Hygiea Hotel; to the railroads for reduced rates, etc.

The venerable Dr. Leslie, the originator of cohesive gold, was introduced by the President, and addressed the Association on that subject. He spoke of the claims made by others, and described the first contour filling ever made with cohesive gold. This gold was discovered by his brother, A. M. Leslie, and himself in 1838. In 1839, he spent a day in Louisville, Ky., where he made the first contour filling, in the mouth of Dr. N. Clouet. The correspondence which subsequently passed between them on the subject is still in existence as evidence of the truth of the claim made by Dr. Leslie.

The subject of Dental Hygiene was further discussed and finally passed.

Dr. McKellops, Chairman of the Committee on Voluntary Essays, read by title a paper which had been prepared for the meeting by Dr. J. R. Walker, during his last illness, upon "The Future of Dentistry—A Prophecy," and on motion it was ordered published in the proceedings.

Dr. W. H. Richards, of Knoxville, Tenn., thought that something should be done by the Association to direct the attention of the General Government to the care of the teeth of the common soldiers, and the appointment of dentists to the Army and Navy. The subject was not discussed.

Pathology and Therapeutics was next called, and Dr. W. C. Wardlaw, of Augusta, Ga., read a paper entitled "Neuralgia, its Association with Dental Lesions."

Dr. Wardlaw said that the term Neuralgia had been bandied about in the most indiscriminate manner, and was often used to conceal ignorance in reference to many aches and pains, the real nature of which was not understood, neuralgia being an entirely satisfactory explanation to many minds. As every painful effect

must have an exciting cause, the object of Dr. Wardlaw's paper was to show that in a large majority of cases of neuralgic pains about the face and head, the specific origin was in dental lesions, and mostly from reflex irritation.

Pain is the only diagnostic symptom; the attacks are irregular, and the exciting cause often the most trivial. The dental lesions causing facial neuralgia are often most obscure in locality and character. Dr. Wardlaw briefly reviewed the anatomical structure and physiological relations of the parts involved, and the principles of reflex nervous action, demonstrating the possibility of neuralgia from dental irritation, and gave a long list of the lesions to which it is most frequently due, and the result of his observations in locating the lesion, and the corresponding point of attack. He finds that the lower molars, especially the third, give earache; the superior molars, headache; lesion of the bicusps gives pain in the cheek and infra-orbital region; neuralgic pains in the eye frequently accompany diseased cuspids or first bicusps. He has known neuralgia of the posterior scalp and shoulder to proceed from a dead lateral incisor, etc. The radical treatment consists in the removal of the cause. In merely palliative treatment anodynes, liniments, etc., are useful. Systemic treatment may be required, with quinine in the periodical type. Bissection of the trifacial nerve, he says, is never necessary in pure facial neuralgia from dental irritation.

Dr. J. J. R. Patrick, of Belleville, Ill., explained his system of correcting irregularities, illustrated by a model and numerous diagrams. He explained the causes of many forms of irregularity of the teeth, cleft-palate, hare-lip, etc., in the unequal development of the bones of the face—excessive growth on the one hand, or the arrest of development on the other, perfect regularity resulting from the equal pace of growth of all the bones, the proper development of the alveolar process, and the eruption of the teeth at the proper point in the arch. He claimed that the deciduous teeth are thrown off like epithelial scales, like the hair of a horse, the shell of a crab, or the claws of lobsters. In living tissue, for absorption to take place as a physiological process, there must be an organ of absorption. If pus is absorbed we have septicemia, because there is no organ to finally dispose of it. As the glands of the mucous membrane throw off mucus internally, and the external

skin throws off epithelial scales, so exuviation of the deciduous teeth takes place in a physiological manner. They are hardly formed before they begin to exuviate, each one bringing up its own process, the deciduous and permanent teeth being entirely independent of each other. The deciduous teeth are largest posteriorly, but the permanent teeth are twice their size laterally. It was a pleasing thought, but only a beautiful myth, that the deciduous teeth serve as guides for the permanent ones. The belief in an organ for the absorption of the roots of the deciduous teeth is dying out, for the question inevitably arises, what becomes of that organ when its work is done? Is there another behind to absorb it, and so on indefinitely? No, it is a process of exuviation. As the acid behind the horn of the stag causes it to fall off, so there is an acid in the mucus from the follicles in an abnormal condition which produces exuviation.

Dr. Patrick said that he was prepared to substantiate the assertion that the deciduous teeth have no more to do with the development of the permanent teeth than have the toe-nails; the proofs are as thick as blackberries. Anthropologists class the negro and the Australian as prognathous people, but there never was a prognathous negro child. While they have the deciduous teeth they have round, chubby faces. The change takes place with the eruption of the second growth, which differs entirely in form and shape, the bicuspid especially differing from the deciduous molars.

Dr. W. H. Atkinson—Said that in the removal of the deciduous teeth there was a return to embryonic conditions at the point of absorption, the *debris* being dissolved in the water of the tissues and taken up at the point of molecular metamorphosis by the lymphatics. He said there were, in the remarks just made, many fanciful generalizations, to which there was not time to reply.

Dr. Patrick—Said absorption was an indefinite word, which did not signify anything in particular; there were two kinds of absorption, external and internal; one of contruction and one of destruction; while the atmosphere is absorbing our tissues, we are absorbing that which lower organisms have built up for us. Cuvier has given us the term *exuviation* as a scientific term for a physiological process, which is not absorption, but is opposed to the pathological process, exfoliation.

Dr. Atkinson—Said this was making a discrimination without distinction; there was no such thing as external absorption. Eruption was throwing off a corneous layer of epithelium, made possible by a process of desiccation; a throwing off of the fluid portions of the external walls of the cells. The lime-salts are melted down and floated to the mouths of the lymphatics and carried off.

At the close of this discussion, the election of officers, etc., took place (see page 561, October number), after which the Association adjourned till 8 P. M., when the paper of Dr. Wardlaw was taken up for discussion.

Dr. Genese, of Baltimore—Reported a case of neuralgia, due to dental lesion, in which he used, with the happiest effect, the acid extract of *Papaver Alba* as a sedative, securing to the patient the first night's rest enjoyed in several months. His sufferings had been extreme, and five sound teeth had been sacrificed in vain. The remaining teeth were of good structure, but close examination revealed softened dentine around an approximal cavity between the bicuspid, over a capped pulp, the unexpected death of which had been the cause of the long suffering. From the time this was remedied there was no recurrence of the "neuralgia."

Dr. R. Finley Hunt, of Washington—While agreeing in the main with the paper, took exception to the use of the term *pure neuralgia* as applied to the result of dental lesions, *pure neuralgia* existing independently of any special local lesion, as an abnormal systemic condition. Here, as in so many other cases, we find the necessity for a more definite nomenclature.

Prof. L. G. Noel, of Nashville, next read a paper entitled "Etiology of Caries of the Teeth, Viewed from the Standpoint of Physiological Chemistry."

Dr. J. B. Hodgkin, of Baltimore, read a paper entitled "Are We Justified in Promising Success in Replantation?"

He doubted the probability that an extracted dry tooth, with lacuna filled with desiccated and possibly decomposed preteplasmic matter, can live again.

Dr. W. H. Morgan, of Nashville, and Dr. Geo. Winkler, of Augusta, described an experiment made with aqua ammonia upon cohesive gold, the former having maintained, while the latter doubted, that the cohesiveness would be destroyed. The experiment, though carefully made, was not thoroughly satisfactory.

Dr. Morrison, of St. Louis—In reply to Prof. Hodgkins' paper, said that he considered replantation in every way a legitimate operation. His successes so far outnumbered his failures that he felt justified in urging perseverance in the practice.

Dr. Stubblefield, of Nashville, read a paper on the "Histology of Hard Structures."

In this paper the writer disclaimed all pretensions to original research, attempting only to render more tangible the somewhat obscure, lengthy productions of the best authors concerning a field which, to the average dentist, is a *terra incognita*. That we know but little about the intimate primary structure and relations of the development of tissues, while the little that is regarded as certain is not clearly comprehended or fully appreciated by the average dentist, is largely due to lack of careful mental training and of thorough professional education. Histologists, as a rule, also, are not good teachers, and consequently fail to present clearly and concisely what they ascertain, losing themselves in a maze of wordy windings through thickets of technicalities and interminable circumlocutions.

The paper, though as brief and concise as possible, in an attempt to cover the whole field of the histology of hard tooth structure, beginning with the formation of the nucleus of the bone-cell, consumed the time till nearly midnight. The Association then adjourned to meet on board the steamer *en route* to Washington City, a recess being taken to enable the members to participate in the deliberations of the Dental Section of the International Medical Congress, before final adjournment.

Saturday, Sept. 3d, the Association was called to order on board the steamer, where the ceremonies of the installation of the officers for the coming year took place in due form, accompanied by rather more than the usual speech-making, and by other pleasant social features, due to the unusual surroundings. Reaching Washington soon after dark, carriages, omnibuses and street cars were in waiting to convey each and all to the lodgings secured in advance by the untiring efforts of Dr. R. Finley Hunt.

At the close of the Congress, the Southern Dental Association adjourned to meet again in Louisville, Ky., in joint session with the American Dental Association, in August, 1888.

AMERICAN DENTAL SOCIETY OF EUROPE.

FIFTEENTH ANNUAL MEETING AT COBLENZ, GERMANY,
SEPTEMBER, 1887.

REPORTED FOR THE INDEPENDENT PRACTITIONER BY DR. E. A. GALLERATO,
HANNOVER.

CONTINUED FROM PAGE 659, VOL. VIII.

THURSDAY AFTERNOON SESSION CONTINUED.

The President announced the Section of Dental Medicine.

Dr. Elliot—I have prepared no paper on the subject, because I know little about it, and it interests me very little. I made a few negative experiments with some new preparations, iodoform, iodoform wax, cocaine, etc. I used for a short time a mixture of sulphuric acid ether and cocaine, advocated by Dr. Herist, formulated by Dr. Taft, and made by Ash & Sons, but could derive no benefit from it. Ash & Sons have stopped making it. I have also used sublimate in solutions of one, two and three per cent., but with unsatisfactory results. Hydrogen peroxide I have also used a great deal, and with good results.

Dr. Miller—Our experience in the clinic has been that sublimate in all solutions invariably turns the tooth black in course of time. I do not find eugenol stronger than carbolic acid. The antiseptic power of iodoform comes from iodine evolved by a solution of the iodoform in fats, etc. The experiments showing that iodoform was not antiseptic were, therefore, most probably made under conditions where it was not soluble.

Dr. Jenkins—I would like to know if any one has noted the effects of cocaine in sub-cutaneous injections.

Dr. Elliot—Dr. Cunningham collected some statistics of cocaine used in this way, and finds the effects undesirable; it produces, not uncommonly, hysteria. The opinion of the profession in England is unfavorable to it.

Dr. Field—I use iodoform, with a two per cent. solution of bi-chloride of mercury, and have never seen a case of blackening of the tooth.

Dr. Miller—One-half per cent., or one to two hundred, is strong enough.

Dr. Elliot—I forgot to mention an invention of Dr. Rosenthal, for the treatment of dead teeth. He uses the exhaust from a current of water by an ejector. The tube cemented into the cavity, the air exhausted, water is let in and rushes into the vacuum, becomes discolored, and is let out. This process is repeated until the water comes out clean. It is not a great success practically, on account of the difficulty of connecting the tube air-tight into the tooth. The least movement of the apparatus loosens it. I made the same thing myself with an ordinary syringe.

The President announced the Section of Operative Dentistry.

Dr. Kingsley—Said that the greatest progress in Operative Dentistry has been in the direction of matrices, which contribute to the comfort of both the patient and the dentist. In looking back over twenty years, one finds that much has been done to make operations more complicated, but thanks to improved instruments, less fatiguing to the operator. But it is to be regretted that the poor patient at the other end of the instrument has not been a gainer in a proportionate degree. Recently, however, certain skillful operators have been bold enough to suggest that it is getting near the time when we should take more seriously into account the question of the wear and tear upon the nervous system of those who are so unfortunate as to need the application of our skill, and so fortunate as to be able to obtain it, and to question whether it is either necessary or justifiable to keep a patient confined three, four, six hours, as has been done, with the rubber-dam, gag, saliva pump, and numerous other blessings and curses combined, while the operator is pounding gold into a broken-down molar which loosens and drops out in another twelve months. The operator stops to eat a sandwich, and the poor victim of misguided and over zealous skill sucks a little brandy through a quill. This is no fancy picture. Such things have been done, boasted of by operators, and for years remembered and moaned over by the victims. It seems to us important for the dentist to take into consideration the life and health of the patient, as well as the small part of the patient's anatomy compressed in a single tooth. We regret that we cannot have Dr. Herbst with us at this meeting. We trust, however, that there are those present sufficiently conversant with his system to lead the discussion, and do justice to it—not making of it a question of country or of patriotism, as seemed to be the case before certain

assemblies in America, judging from the reports in the dental journals. Science and art should know no country. With regard to implantation, it will be a source of regret if the searcher after hidden things duly elected by this society does not furnish us with a theory (we must have a theory) explaining how a tooth which has been out of the mouth a greater or less number of years, and has undergone all sorts of vicissitudes, can be planted in a hole artificially made in the human jaw, and there become solid.

Dr. Bryan—I have had one case of implantation where I extracted a badly abscessed first bicuspid. I waited several days until granulations set in, and then implanted, fastening the tooth to the adjoining bicuspid. It has been in since March 10th, and the last time I saw it, was doing nicely. The gum looked natural, and there was a hard, slightly swollen place over the tooth, apparently the development of bone.

Dr. Elliot—The root will be absorbed, and it will fall out.

Dr. Miller—The subject of implantation, as practiced by Dr. Younger, has perhaps more than any other occupied the minds of the profession, particularly in America, during the past year. You are all, no doubt, familiar with the operation. It consists in drilling or boring holes (sockets) in the alveolar process, at points where the natural teeth are missing, and planting or implanting teeth in these artificial alveoli. That teeth implanted in this manner will, as a rule, be retained for a certain length of time, there can be no doubt; how long, we are utterly unable to say. Dr. Younger uses for the purpose of implanting, not unfrequently, teeth which have been for days, months, and even years out of the mouth, and believes that the pericementum of such teeth becomes revitalized, so to speak, when they are planted in living tissue. In this, I think, there can be no doubt that Dr. Younger is entirely in error. When a tooth has been out of the mouth so long that the pericementum has become perfectly dry, there can be little hope of restoring it to life again. As to the manner in which such teeth are retained in the jaws for a certain time, I have already expressed myself in the *INDEPENDENT PRACTITIONER* for January, 1887. I have found by experiments on rabbits, that pieces of dead dentine may be retained and firmly held in living tissue by encapsulation. Small pieces brought under the skin or into the abdominal cavity under aseptic conditions, soon become enclosed and

firmly held in a dense capsule of connective tissue, and could not be removed without tearing the tissue. In all cases, however, resorption soon began, forming irregular resorption territories or cavities, into which the tissue grew, thus forming another temporary bond of attachment between the dentine and the surrounding tissue. In one case, where the dentine was previously left for twenty-four hours in putrid saliva, suppuration took place and the piece was thrown off. When pieces of dentine having living pericementum were used, an apparently permanent union with the surrounding tissue was formed, no resorption being evident after three months. I see no physiological reason why the replantation of teeth, where the alveolar process has been sufficiently preserved to enable one to obtain a normally deep socket for the tooth, should not show nearly as large a percentage of successes as transplantation. The operation should always be performed under antiseptic conditions, and, so far as possible, freshly extracted teeth should be made use of.

Dr. Elliot—Will not absorption occur, even if the pericementum is healthy and good?

Dr. Miller—It may. The roots never exactly fit the bored holes, and the consequent irritation may cause them to be absorbed or thrown off. For that matter, even normal teeth will also be resorbed, I have seen roots with absorbed indentations, and the tooth held only by tissue that had grown into them.

Dr. Jenkins—I think in the majority of cases the success of this operation will depend upon the constitution of the patient. With some, liberties can be taken; with others, not. I once had a patient come to me complaining of some slight inconvenience from a pivot tooth, and I found the pivot ran through the side of the tooth into the alveolus at least half an inch. Another patient, away in the country, had a tooth extracted by the village barber, and the next day, dissatisfied with her appearance, she replaced it herself. In a few days she came to me in great pain, and with an abscess, which just then I had no time to treat, and, therefore, postponed for a few days. She did not come back for six months, when I treated the abscess and made a gold filling in the tooth. It seemed to be firm and in serviceable condition, and for all that I know it may remain so to this day.

Dr. Field—I have implanted many teeth, but the roots have all resorbed.

(TO BE CONTINUED.)

Editorial.

IMMEDIATE ROOT FILLING.

There is a curious lack of comprehension of the principles involved in a practice now urged by many dentists—that of immediate root filling. When Dr. Harlan, at the last meeting of the American Dental Association, condemned this method of procedure, and at the same time stated that he probably filled sixty per cent. of his cases without prolonged treatment, he was upbraided with inconsistency. A usually very intelligent contemporary says that between those who condemn the practice of immediate root filling, and yet admit that in a majority of cases they practice it, and those who advocate the doctrine, there exists "a distinction without a difference." This is certainly an error. There is no difference of opinion concerning the propriety of filling aseptic canals immediately, and these probably comprise more than half the cases in practice. Nor is there any very serious questioning of the practice of the immediate filling of canals where fistula exists. It is concerning the method of procedure with septic roots—of so-called blind abscesses—that a difference of opinion is expressed. No one questions the advisability of, usually at least, immediately filling a canal that is in a healthy state, save for the mere traumatism of the removal of a pulp. All that prolonged treatment can do is to reduce to a normal condition, as far as inflammation and septicism are concerned, and if neither has ever existed in the tissues surrounding the tooth, surely the first state is as favorable for filling as it can be subsequently. There may be a difference of opinion about the condition of the living portion of the dentine, but so far it has not prominently entered into the discussion of the subject.

The advocates of immediate root filling urge it as applicable in all cases—in canals that have long been in a septic state without other drainage than that through the cavity of decay, in cases of active putrefaction of the pulp, as well as in teeth from which the pulp has but just been removed—and it is here where issue is joined. Those who practice immediate filling are strong in the faith of the bacterian origin of all septic conditions. Their method of procedure in a

case of blind abscess is practically this: The rubber dam is so adjusted as entirely to exclude saliva, and access to the pulp canal is obtained. A disinfectant — preferably peroxide of hydrogen — is then introduced into the canal, either by means of a delicate syringe or by a few fibers of cotton wound on a broach, and this is forced into the canal until all signs of septic products have ceased. This is usually determined, if peroxide of hydrogen is used, by the cessation of effervescence; if other agents, by the fact that they do not change in color or appearance. An instrument is then used to open the canal still further. A Morey drill is introduced, or the canal is enlarged, cleared and opened yet further by the excellent Donaldson canal cleaners, when the disinfectant is again employed, and this is continued, if possible, until the apex is reached and the agent is carried through the foramen. When entirely satisfied that the territory is disinfected, a germicide, like mercuric chloride, is introduced and carried to every portion, and the canal is dried and filled at once.

There is much that commends itself to the judicious operator in this method. The reasoning of its advocates is, that as the diseased condition is entirely due to microbes, when they with their products are destroyed and removed there is no excuse for prolonging treatment, and the process of repair should be at once commenced, and this will be best secured by the absence of all medicaments and the permanent closing of the usual source of infection. In most cases this is probably true, but we think there are one or two points that are overlooked. In many cases of blind abscess of long standing there is an infiltration of septic matter into the territory surrounding the original point of infection. Not infrequently there is osteitis of a more or less pronounced character, with a deposition of inflammatory products that have assumed, perhaps, an indurated character. There is a low chronic form of this inflammation extending for some distance into the surrounding tissues, and something beside a mere disinfectant or germicide is required to promote the absorption of the depositions. In cases of induration, as in all abnormal growths, there are but two methods by which nature can remove them. The one is by absorption, and the other by a breaking down of the tissues and sloughing. We desire to bring about the former and to guard against the latter. The readiest and most convenient, as well as the most effectual method of reaching the

disturbed territory, is through the root canal, and if this be closed we must rely, in case the inflammatory products are not at once removed, upon medication by absorption through the gum, or upon surgical interference. The latter is to be deprecated unless all other means fail. The gums consist of fibro-cartilaginous tissue and do not readily absorb medicaments. So that if there be, as too often there is, a deposition of indurated lymph, the pulp canal forms the natural passage to the centre of the point of disturbance, and should be kept open for the introduction of the proper stimulants.

Again, when the septic organisms have worked their way back into the tissues in case of a blind abscess, it is extremely difficult, if not impossible, to reach the farthest point of infection at a single sitting. We must often trust to absorption and slow infiltration of the antiseptic to reach the extremest point. The tooth tissue, too, may contain septic fields which can only be reached by gradual penetration. There is no security that a single application will make all the tissues entirely aseptic. The process of repair should be commenced, at least, before the whole is permanently sealed up. If an acute pericementitis succeeds the cleaning of the root-canal, it is much more easily treated if the canal be open than if it be closed. Hence, we can readily see that there exists a certain class of cases in which common prudence would demand that we proceed with due caution. The proper treatment of these requires, upon the part of the operator, not only caution, but a thorough knowledge of the pathology involved. Every operator should, of course, at once proceed to disinfect them if they are septic, and to introduce a proper germicide. But once made aseptic, the method of procedure should be changed. Violent drastic antiseptics should no longer be employed, but the whole attention should be directed toward the removal of the inflammatory products, and the healing of the cavity left in the tissues, antiseptics proper being employed only to keep the whole in an aseptic state. Not infrequently have we filled the root-canal with pure tincture of iodine to stimulate absorption, and under its influence seen an induration that exhibited itself upon the outside of the jaw rapidly melt away. As a resident, we know of nothing that is more prompt in its action.

Much has been said concerning the use of coagulatives of albumen in the treatment of dead teeth, and we believe that undue stress has been laid upon what is practically of little moment. The

most of the remedies commonly employed are coagulators, and we fail to see any objection, on this account, to their proper use. Albumen is coagulated spontaneously upon the admission of air, and any which may exist in an unorganized or inactive state will coagulate in any case. We would not introduce a coagulant into pus, unless at the same time it was broken up and provision made for its removal. In a tooth that is in a septic state there can be no protoplasmic albumen in the dentinal tubules, the mouths of which might, by coagulation, be obstructed and the entrance of an antiseptic influence thus prevented, and hence we fail to comprehend what practical danger there may be in the use of coagulating remedies. An antiseptic, whether a coagulant or not, should be introduced only when disinfection and the removal of septic products is as complete as possible, and our choice of a remedy then, whether it be carbolic acid, iodoform, permanganate of potassium or mercuric chloride, would depend upon something more than its power to coagulate albumen.

In cases in which a fistulous opening through the gum exists, immediate root-filling may often, perhaps always, be permissible. There is perfect drainage through the fistula, and it is possible to reach the point of infection, if necessary, through it. There is a question, however, whether it be not sometimes better to keep the canal open and to treat through it, especially if there be free communication through the foramen, than to run the risk of a necessity for attempting to follow up the fistula through its usually tortuous course, for sometimes the opening is at a considerable distance from the disease centre. An opening might, of course, be made through the external alveolar plate, but this surgical interference is what we usually desire to avoid.

The summing up of the matter is, then, according to our view, that immediate root-filling is admissible in cases where there is little septic infection or inflammation beyond the apex of the tooth, in most cases of abscess with a fistulous opening, and in the majority of those in which disinfection is positively complete. But when there is probably considerable infiltration or deposition of inflammatory products, or when there is a chronic irritation as manifested by a persistent pericementitis of a sub-acute character, the use of the proper remedies introduced through the pulp-canal should be continued until resolution is either begun or completed.

THE A. D. S. E. REPORT.

In "Current News" for this number will be found a letter from Prof. Peirce, of the Pennsylvania College of Dentistry, denying the correctness of certain statements in the report of the American Dental Society of Europe, as published in the last number of this Journal.

As soon as it could be put in type, proofs of that part of the report were forwarded to Dr. Miller. Had he been within reach, they would have been sent him before the publication. Immediately upon receiving them, he wrote us that the reporter had misconstrued his language somewhat, and said—

"The remarks I made were about as follows: Certain of the dental schools in America have succeeded in bringing the title D. D. S. into such bad repute that it is not only no honor to possess that degree, but its possessor carries with it the suspicion that the possessor is either a quack or an ignoramus, who, being unable to accomplish anything here, has either bought a diploma in America, or, what is really worse for the standing of the profession, has obtained it by a mere farce of an examination, regardless of previous education. You all know the present standing of the American dentist in Germany, and the endless annoyances that esteemed Americans have been put to by the war against them. I need not recapitulate them. Suffice it to say, that 'D. D. S.' and 'American Dentist' are adornments of which we often have occasion to feel ashamed, and which we cannot attach to our names without being eyed with suspicion. (Dr. Patton; *exactly!*) According to Petermann's Almanack, there were practicing in Germany, in 1883 (excluding Americans), graduates of the Pennsylvania Dental College, forty; the Philadelphia Dental College, thirty-four; the Baltimore Dental College, seventeen; the New York Dental College, fourteen. No other college had furnished more than three.

"From this list each one draws his own conclusions, though I should say that it might not be just to infer that the four colleges named are all necessarily guilty, or that they have lowered the standing of the dental profession in exactly the proportion indicated by the above figures. Among other things, the age of the college should be taken into consideration. Perhaps some of our younger colleges have not yet had time to show how fast they can turn out doctors."

It will be seen that Dr. Miller disclaims having said that they had a list of diplomas improperly granted, but that it was one of diplomas granted to practitioners in Germany other than Americans. The reporter understood him to give a list of foreign false diplomas, and so stated it. It was impossible for us to send proof of their remarks to speakers for correction, and we were forced either to suppress the report entirely or to publish it substantially as received.

Petermann's list of foreign graduates of American colleges was published in 1885, and must have been compiled from the returns of 1884. It was in that year that the INDEPENDENT PRACTITIONER published a series of articles upon "Dental Education," which made a decided commotion, and the immediate result was the formation of the Association of Dental College Faculties, and a long step toward a higher standard and a degree of uniformity in conferring diplomas. From that time we believe that the irregular granting of degrees was materially checked, if not altogether stopped. We have publicly offered to publish the particulars of any well-attested case of irregular graduation, if any such occurred, but none has been regularly brought to our notice, and our natural inference is that a practical reform has been brought about, and that henceforth American dentists abroad will have no cause for complaint. If such a case should come to their knowledge, their duty is to see that it be published to the world. It will take a long time to erase from the minds of foreign people the impression left by the disgraceful Delavan fraud, and the too lax rules of some reputable colleges in granting degrees to foreigners, but if the schools will, in the future, rigidly hold each other to the agreement of the Association of Dental College Faculties, the D. D. S. will be lifted from its present low condition in Europe.

We think that the extract from Dr. Miller's letter is a sufficient explanation and answer to the interrogatories of Prof. Peirce.

AN UNCALLED FOR CRITICISM.

The last number of *Correspondenz Blatt für Zahnarzt* contains an editorial article which seems to have been conceived and written in a singular misconception of the leading editorial in this Journal for September last, "Concerning Contests." The editor of *Correspondenz Blatt* does not seem to have the faintest comprehension of the scope

and aim of that article. He should know that the editor of this Journal lives more than four hundred miles from the residence of Dr. Bodecker, and that whatever has been published in our editorial pages has been without his knowledge and without any consultation with him. When we said that Dr. Herbst had risen to his present position against the most adverse circumstances, we paid him the highest compliment which we could offer, for Americans honor the man who earns an honorable position far above him who is born to it. We never said that Dr. Bodecker paid Dr. Herbst's expenses to America, and when the editor intimates that we did, and then brands it as a falsehood, he simply exhibits his own disingenuousness. We said that Dr. Bodecker's sacrifices and labors in the establishment, in America, of the Herbst system of filling teeth, simply because he believed that he was serving his profession, should shield him from any charge of ulterior motives, and entitle him to the gratitude of American dentists, even though he might be mistaken concerning the merits of the rotary method of filling teeth. We believe that Dr. Herbst's visit to America resulted in good to American dentistry. There is here a warm feeling of admiration for him as a man, and the attempt of the editor in question to foment an ill-feeling, either toward Herbst in America or Bodecker in Europe, and to place them in an attitude of opposition to each other, is unworthy the journal which he controls. There was nothing in our article that should be offensive to Herbst, and if he is content the editor need not officiously interfere. But if he insists upon standing as the self-elected champion of Herbst, he shall have the field to himself, for we are no man's special advocate.

CREDIT TO WHOM CREDIT IS DUE.

We desire courteously to call the attention of the editor of *The British Journal of Dental Science* to the fact that the series of articles which he is publishing in that valuable periodical, under the title of "Contributions to the History of the Development of the Teeth," are the property of *THE INDEPENDENT PRACTITIONER*, and the common code of ethics which should govern all professional men demands that if he uses them he should, at the least, acknowledge the ownership. We are well aware that at the outset he gave credit, but we submit that this hardly answers the requirements of such a long series. We do not desire to be captious, but the B. J.

D. S. does not, like some American journals, live almost exclusively by general pillage, and we look to it for an example in journalistic ethics. Would it not be the proper thing to append the name of this Journal to each of the articles?

FASTIDIOUS OPERATING.

If there be any one thing which a dentist should cultivate, it is delicacy and lightness of touch. Some whom we have known go at their work like a miner with his pickaxe. They are rough, harsh, and their hand, whether with the excavator, the plugger, or engaged in adjusting the various appliances of our art, is ever heavy. Their arm always rests burthensomely upon the patient's head, their fingernails are continuously digging into tender tissues, and there is a coarseness and a clumsiness about all their operations that marks an unpardonable heedlessness of the comfort of the patient. There are few things which so forcibly commend an operator to those under his care as tenderness, and even daintiness, in regarding their sensibilities. The engine bur should be directed as if it were a sentient thing, and napkins should be used as if they were a spontaneous production.

BIBLIOGRAPHICAL.

THE DENTIST'S MANUAL OF SPECIAL CHEMISTRY. By CLIFFORD MITCHELL, A. B. (Harv.) M. D. Chicago: Published by the Author, 603 Rialto Building. 1887. Price to Dental Students and Practitioners, \$1.80.

There has been a lamentable lack of text-books in some of the departments of our specialty, and not long since, the Association of Dental College Faculties took measures to supply the deficiency. This book is the first fruits of that movement. Those engaged in the teaching of chemical science in dental schools have long felt the need of some work particularly adapted to the end sought. The field of general chemistry is so broad, that to master the whole requires time that can be more profitably employed otherwise, for even were all the time usually spent in professional studies devoted to this one branch, it would not suffice to make an accomplished chemist of the student. Hence, after the mastery of general chemical laws, the medical or pharmaceutical student must pursue a special course, and books have been written for his guidance. Dental chemistry is another restricted field, but heretofore no exact guide for the dental student has been provided.

Without making pretensions to technical knowledge, an examination of Dr. Mitchell's book leads us to the conclusion that it is well adapted to the end in view. A friend, himself a chemical expert, writes that he thinks the work of too advanced a character for the average student in dental colleges. This may be the fact, but certainly it is an error on the right side. If the dental student is not competent to digest the contents of this work, he is not sufficiently advanced in general science to study dentistry with profit, and should pursue his preliminary course for at least another year. The book contains nothing which he ought not to know, and nothing the possession of which will not make him a better dentist.

We shall not attempt a critical analysis of the contents of Dr. Mitchell's work, first, for lack of time and space, and second, because such a task should only be undertaken by one who is thoroughly versed in the technicalities of chemical science, but we shall simply advise every dental student and practicing dentist to purchase and study it, feeling assured that no one can do this without great profit. Especially will he find the chapters on the chemistry of fermentation and putrefaction, and that upon laboratory work, very instructive, and worth many times the price of the book.

A LABORATORY MANUAL OF CHEMISTRY—MEDICAL AND PHARMACEUTICAL. Containing experiments and practical lessons in inorganic synthetical work; formulae for over three hundred preparations, with explanatory notes; examples in quantitative determinations and the valuation of drugs, and short systematic courses in qualitative analysis, and in the examination of urine. By OSCAR OLDBERG, Pharm. D., and JOHN LONG, Sc. D., with original illustrations. Chicago: W. T. Keener, Publisher. 1887.

This work is written from the standpoint of the laboratory, and we should think must almost be indispensable to every pharmaceutical chemist. It does not follow the usual plan of chemical text-books, although the leading principles of inorganic chemistry are plainly set forth. The student who desires to perfect himself in synthetical work will find here just what he most needs, for in the consideration of most of the elements one or more experiments are detailed, which the student may perform, and which will teach him the nature and characteristics of the combinations more concisely and precisely than any other means. As a work of reference for the pharmacist, it must prove extremely useful, and even the amateur chemist will find it of the greatest benefit in his investigations.

Part III, analytical chemistry, although condensed, will be found sufficient to guide the student in the performance of all the usual examinations, for the principal tests are given with enough of detail to answer all practical purposes.

A STUDY OF THE HISTOLOGICAL CHARACTERS OF THE PERIOSTEUM AND PERIDONTAL MEMBRANE. By G. V. BLACK, M. D., D. D. S. Professor of Pathology in the Chicago College of Dental Surgery; with 67 original illustrations, Chicago: W. T. Keener, 96 Washington St. 1887.

Those who know Dr. Black recognize in him a painstaking and careful observer, a vigorous thinker and a clear and lucid writer. The papers which comprise this book of 138 pages were originally contributed to *The Dental Review*, in anticipation of their subsequent appearance in book form. No more exhaustive treatise upon any single dental tissue has yet been presented to dental students. The illustrations are all from original drawings, and are very clear and definite.

We had marked a number of passages for excerpt, but lack of space and the imperative demands of other matter forbid their insertion. The author is a very positive writer, and some of his assertions seem dogmatical, but they are the results of long and exhaustive study of the subject, and they are consistent from the standpoint which he has selected. The book might easily have been "padded" to twice its present limits, had the custom so common among dental authors been followed, and the dental depots and catalogues of manufacturing firms been ransacked for advertising cuts of implements and instruments long out of date, old forgotten papers been included, and the book printed with extra heavy leads and with margins broader than the text. Nothing, however, will be found but original matter, nor is that "displayed" in a manner to offend good taste. No one who has not read Dr. Black's "Periosteum and Peridental Membrane" can pretend to a full knowledge of the subject, and we most earnestly commend it to every dentist and dental student.

INSOMNIA AND OTHER DISEASES OF SLEEP. By HENRY M. LYMAN, A. M., M. D. Professor of Physiology and of Diseases of the Nervous System in Rush Medical College, etc., etc. Chicago: W. T. Keener, 96 Washington St. 1887.

Whether Insomnia, which is the lack of sleep, can be technically

considered one of its disorders, might possibly be a debatable question; but that it is a most distressing nervous affection there can be no doubt whatever. To the wearied worker, exhausted by the toil of the day, who courts the drowsy god in vain and tosses upon his restless couch through the long weary hours of the night, there is something so exasperating in the thought that, instead of gathering strength for the succeeding days' demands he is wasting what of energy the preceding day had left, and that nature's great seasonal course, which should medicine all his ills, mocks him as if he were a second Tantalus, that it adds another horror to the situation, and he is ready to accept anything which shall bring to his senses the needed repose. This is the condition of so many operative dentists engaged in working upon sensitive, living tissue, that such a work as the one under notice will commend itself to a large proportion of the dental profession. It is a scientific consideration of the conditions of the nervous system which induce insomnia, and the remedies which will often bring relief. Those afflicted with this distressing disorder should, by all means, purchase and read the book.

A COMPLETE HANDBOOK OF TREATMENT. Arranged as an Alphabetical Index of Diseases to Facilitate Reference, and Containing nearly 1000 formulas. By WILLIAM AITKIN, M. D. (Edin.), F. R. S. Edited with Notes and Additions, by A. D. ROCKWELL, A. M., M. D. New York: E. B. Treat, 771 Broadway. 1887.

This is another of the valuable series published by Mr. Treat under the general title of "Medical Classics." The book differs from the usual "Index of Diseases," by laying comparatively little stress upon symptoms and etiology, but devoting almost exclusive attention to treatment. For the task of preparing such a work, Prof. Aitkin is specially qualified, not only by clinical but by descriptive experience. His encyclopaedic work on the Science and Practice of Medicine is a standard authority wherever scientific medicine is practiced. This Handbook of Treatment is an epitome of the latter work, and to the wants of every-day practice, to the emergencies which will constantly arise in the daily visits of all physicians, it is even better adapted. It is, in fact, the practice of general medicine compressed and contained within the limits of a book of 450 pages. We need not say any more in its favor.

RECTAL AND ANAL SURGERY, with a Description of the Recent Methods of the Itinerants. By EDMUND ANDREWS, A. M., M. D., LL. D. With original illustrations. Chicago: W. T. Keener, 96 Washington St. 1887.

The regular physician has, within the last few years, been compelled by the itinerant quacks to give some attention to a too much neglected part of the great field of medicine and surgery. Traveling charlatans, shrewdly perceiving that in diseases of the anus and rectum there was a great field for speculation, invaded it, and have reaped a rich harvest of fees from the afflicted. They have devised, in the course of time, some useful methods and remedies. Especially in the treatment of hemorrhoids were they successful, by the injection of a mixture of olive oil and carbolic acid, and the secret was, for some time, jealously guarded, and often sold for large sums. This book is mainly devoted to an exposition of these empirical methods of practice, but there are also given other and more regular remedies and modes of operating, and altogether it forms a very useful hand-book for the rectal specialist.

NITROUS OXIDE. Its Properties, Methods of Administration and Effects. By S. H. GUILFORD, A. M., D. D. S. Professor of Operative and Prosthetic Dentistry in the Philadelphia Dental College. Philadelphia. 1887.

This is a hand-book intended for those engaged in the administration of this anæsthetic, who, too often, are entirely ignorant of its physiological action, of the possible dangers attending its administration, and of the methods demanded in case of adverse symptoms. It should be read by every one so engaged—but it will not be. Those who need it the least will be most apt to study it, while those to whom a work of this kind should be an essential will continue to give nitrous oxide in serene unconsciousness or sublime indifference to their lack of necessary knowledge.

The author, than whom few are better or more favorably known in the dental profession, quotes freely the opinions of others as to the action of nitrous oxide, but is quite too modest in presenting his own convictions. There has been an infinite deal of nonsense written upon the subject that is not worth quotation, and we should have more highly valued the deductions of Dr. Guilford himself.

Current News and Opinion.

Editor Independent Practitioner:

While visiting a Museum at Naples, I happened to see a set of dental instruments which were found in Pompeii, and I was led by curiosity to examine and sketch several of them in my note-book. There were four varieties, and several sizes of each variety. A copy of these sketches, with one specimen of each, is shown in the six following figures. These instruments consisted of forceps and tweezers of different sizes and patterns. They appeared to have been intended as aids in the use of wire or strings for binding in loose teeth, so that they would be firmer. They were also peculiarly adapted for placing strings around teeth for the purpose of extraction.

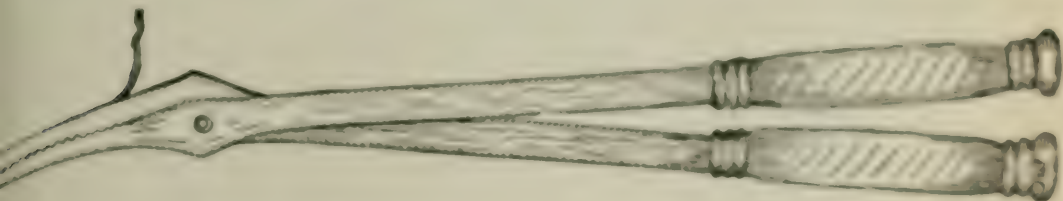


Fig. 13.—DENTAL FORCEPS FOUND IN POMPEII.

The largest instrument (Fig. 13) was a pair of flat transversely serrated beaked forceps, about eight inches in length, which, though smaller, resembled those now used by shoemakers for drawing the "uppers" over the bottom of their lasts. The beaks of this instrument, which were evidently made of bronze, were about one-fourth of an inch in width.

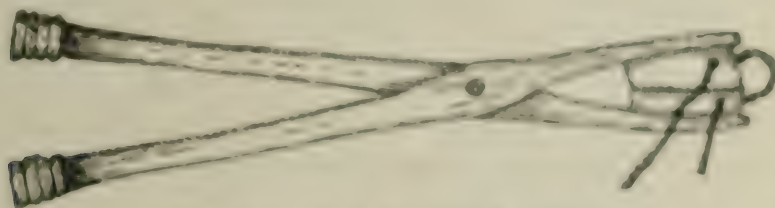
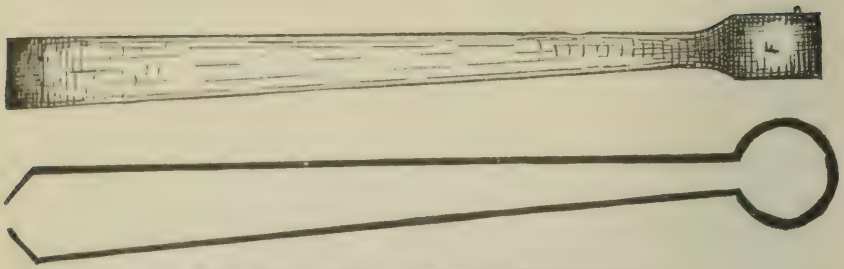


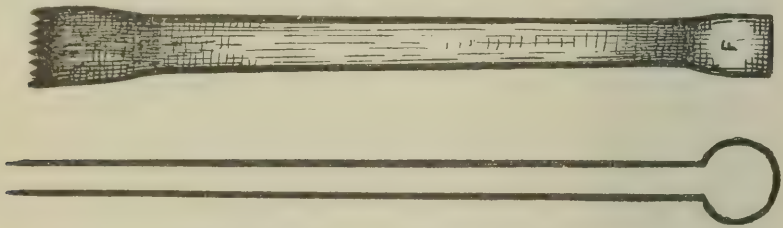
Fig. 14.—SAW BEAKED FORCEPS.

Fig. 14 illustrates another variety of forceps, an instrument about five inches in length. In the beaks were longitudinally fixed blades, having teeth which locked when brought together, fitting into each other like those in the jaw of a steel trap. Near the end of each saw blade was a hole, evidently made for a string or wire for adjustment about the teeth.



Figs. 15 and 16.—DENTAL TWEEZERS.

Figs. 15 and 16 illustrate different views of one of a variety of tweezers, evidently made of bronze, which were probably intended for adjusting strings or wire. These instruments resembled in form the tongs used by blacksmiths, but they were as thin as the handle of a silver teaspoon; they were from a quarter to a half inch wide, and from three to five inches in length, and about one-sixteenth of an inch or less in thickness, the edges being smooth. The following figures, 17 and 18, illustrate still another variety of tweezers, apparently made for the purpose of passing wire or string between roots



Figs 17 and 18.—DENTAL TWEEZERS.

From all appearances, teeth were generally extracted at this period with strings adjusted by the tweezers and drawn by means of larger forceps (Fig. 13), or by winding the string about the hand. Although I have shown but one sample of each, there were several instruments of each kind in these collections, varying in size.

Respectfully,

J. N. FARRAR.

Editor Independent Practitioner:

At the American Dental Society of Europe's fifteenth annual meeting, held at Coblenz, Germany, September, 1887, Dr. Miller, of Berlin, in discussing Dr. Cunningham's paper on education, made use of the following language (published in *INDEPENDENT PRACTITIONER* for December): "We have a record of the foreign diplomas improperly granted, and the Pennsylvania school heads the list, with the Philadelphia a good second; Baltimore stands next, and New York is fourth. No other college has issued more than three. The Pennsylvania and Philadelphia colleges have done more harm here by awarding diplomas to unworthy persons than sham institutions have by selling them."

Dr. Miller is a scientific man, and has therefore learned the value of accuracy in speech as well as work, and we infer that he has not in the least deviated from what he would regard as strictly true in making the above statement re-

garding the American schools. As the faculty are, individually, intensely interested in the Pennsylvania College of Dental Surgery, we should like Dr. Miller to answer the following questions:

1. When he speaks of the "Pennsylvania School," does he allude to the Pennsylvania College of Dental Surgery? if so,
2. What does he mean when he states that a diploma has been improperly granted?
3. Will he please state to whom these diplomas were granted by the "Pennsylvania College?"
4. Will he also state the year in which they were granted and the date of the diploma?

Dr. Miller says "he has a record," having a record, these questions can all be easily answered. The Faculty of the Pennsylvania College of Dental Surgery are desirous that its *name* and *fame* shall be as free from blemish as possible, and that it shall, in future, be, as it has endeavored to be in the past, free from "doing harm" to a profession which it has for years been laboring to educate and elevate. We, therefore, ask, in justice to ourselves, and to said college, that a speedy answer be given to these several inquiries.

Criticisms of the above general nature do little or no good, and leave the impression that they have originated in a spirit of jealousy or personal pique, which we shall be sorry to attribute to a man of Dr. Miller's scientific eminence and professional ability. We, therefore, hope he will, without delay, furnish names and dates as requested.

C. N. FINE, DEAN.

DAVID M. PARKER, M. D.

At the 20th annual meeting of the American Academy of Dental Science, held in Boston, Nov. 16, 1887, the committee appointed to submit resolutions concerning the death of Dr. David M. Parker, reported the following, which were unanimously adopted:

Resolved, That the American Academy of Dental Science has received with sincere sorrow the intelligence of the decease of our late respected friend and associate, David M. Parker, M. D., of Boston, an honorary member and former President of this society.

Resolved, That by the death of Dr. Parker this Academy has lost one of its most worthy members, a man of excellent judgment and skill in his profession, and always interested in all movements looking towards the better organization and education of the profession and the advancement of its practice. He was highly esteemed in the community in which he lived, because of his kindly virtues and his earnest, upright and sincere life.

Resolved, That the proceedings of this Academy this day, in honor of our lamented brother, be engrossed upon the records, and communicated to the widow of the deceased, with the assurance of our deep sympathy in her bereavement. Also that a copy be transmitted to the DENTIST'S FRATERNITY, the Dental Classes, and the Boston Medical and Surgical Journal for publication.

ELIYAH H. FURBER, J.

JACOB L. WYLLIE, Secy.

FRANK S. HARRIS, S.

FIRST DISTRICT DENTAL SOCIETY.

The annual meeting will be held in Masonic Temple, Twenty-third Street and Sixth Avenue, New York City, January 16, 17 and 18, 1888.

The last annual meeting of this society was one of the largest and most successful ever held in America. Judging by the programme (for which we have not the necessary space), the meeting for 1888 will be fully as interesting and noteworthy as any of its predecessors. The clinics, which will be held at the New York College of Dentistry, will form a special feature of the meeting, and will occupy the forenoon of each day. A large number of operators have promised to demonstrate their specialties.

Any dentist who has not received a direct invitation is requested to consider himself personally addressed by this general notice, and may rest assured of a cordial welcome. Programmes and further particulars may be obtained by applying to the President, Dr. W. W. Walker, 69 West 9th Street, or to Dr. A. L. Northrop, Chairman Executive Committee, 57 West 49th Street, New York City.

FILLING ROOT CANALS.

There are so many ways of filling root canals that I feel like apologizing for suggesting another. I have met with such good success with the use of Beta Naphthol, that a few simple directions may be of service to some one who has not yet found a method that is always satisfactory. Not that any claim of infallibility is to be made for this one, which is not yet old enough, though so far, all roots so filled have done well.

DIRECTIONS.—Melt the crystals into small lumps, and put one or two of them in the pulp chamber. Then with a suitable shaped instrument, heated sufficiently to melt the naphthol, flow it into the canals, and also allow enough to remain in the pulp chamber above the canals to partly fill this. A piece of gold is then to be placed over the now solid naphthol, and the filling with gold is completed.

W. H. ROLLINS.

DR. J. H. GARTRELL, of Penzance, England, for whom Dr. Younger implanted two lateral incisors at a clinic given during the meeting of the International Congress in Washington, reports through the *Dental Record*, of London, that the teeth were lost within two weeks. He says that they got so loose about ten days after insertion that he could not get on with them, and on the twelfth day a dentist in Ottawa, Canada, replaced them again, when he kept them for another day; then the silk ligature gave out once more, whereupon further efforts to keep them in place were abandoned.

The cases were unfavorable ones. Dr. Younger operated against time, and one of them only consumed six minutes from the commencement to the finish. They were retained only by silk ligatures, which soon slackened and allowed the teeth to become loose. Common surgical prudence would seem to demand that they be held immovable, for no one would expect union of the fractured ends of a bone if movement was permitted.

IF THERE IS ANY ONE THING that will test the amount of saving grace that a man possesses it is to have dealings with the Post-office Department. For years it has been the custom to place upon the one-cent envelope a request to deliver to some other person a circular that did not find the one to whom it was addressed, and to place the name of the firm or corporation upon it, with an announcement of business. Some post-office sharp has just discovered that this is illegal, and has reversed all the previous decisions of the department without notice, leaving business firms, etc., with perhaps many thousands of such envelopes on their hands and unmailable. Every dumb ass who gets a position of power in the department, finds it incumbent upon himself to do something to let the people know that he is *in the saddle* instead of *under it*, and straightway makes a decision that disturbs the whole course of business and causes great inconvenience and expense to every business man in the country. There is not enough of sound business sense in the whole department at Washington to run a Chinese laundry.

THE FOLLOWING LETTER is but one of many such received. We have yet to hear from those who have received the book anything but the highest commendation.

"The copy of 'The Microscopic Structure of a Human Tooth' came to night. It is just beautiful. It should be in every dental office in the land. It may well be called a study, for it is a perfect one. It cannot be examined without profiting the examiner greatly. How you can afford to send it at the price I cannot understand. I owe you many thanks for giving me the opportunity to obtain it, and shall always entertain a feeling of gratitude to the A. P., not only for all the good which I have derived from it, but for this crowning instance of its devotion to the wants of dentists."

SHEARJASHUB SPOONER, whose name is well known to all dentists acquainted with the history of their profession, says in the preface to his "*Essay on the Art of the Manufacture of Mineral, Porcelain or Incorruptible Teeth*," which was published in 1838, that he had lately made from New York a tour to Philadelphia, Baltimore and Washington, for the purpose of gaining dental information, and that of more than twenty dentists upon whom he called, he found only two willing to exchange secrets in the making of teeth.

FOR SOME MONTHS the editor of this journal has been using in practice the "Imperial Alloy," an advertisement of which appears in this number, with most satisfactory results. In color, working qualities and apparent strength, it is among the best of the very many with which he had experimented. So far, it does not seem to shrink in the tooth, or exhibit any tendency to assume a spheroidal shape, while it retains its polished surface to a surprising degree.

AN ARCHER CHAIR in good serviceable condition, with footboard, spittoon and operating table complete, may be purchased for twenty-five dollars. Apply to the editor of this journal.

DRS. T. E. WEEKS AND M. G. JENISON, of Minneapolis, send us, neatly bound, a volume containing some hundreds of cuts of the full human denture, intended for the registration of operations in the mouth, for recording fillings and for examination charts. There is an index for the names of patients to facilitate reference, with blanks for necessary registration on each page. The binding of these charts in such a compact and convenient form was a happy thought

PROF. TRUMAN, of the Philadelphia University, suggested the combination of iodoform with arsenious acid for devitalizing exposed dental pulps without causing pain. We recently made a paste of these two agents, rubbed together, and moistened with carbolic acid, and applied it in an aggravating case of pulpitis. The object desired was effectually accomplished, and without giving the slightest degree of pain to the patient. F.

DR HORATIO C. MERRIAM, of Salem, Mass., has compiled a directory of responsible firms engaged in the manufacture or sale of implements and materials used by dentists, and of which the depots do not keep full supplies. Such things as jewelers' tools, broaches, blow-pipes, sheet metals, draw and screw-plates, pliers, pivot wire, benches, etc., etc., may be obtained of the dealers, whose names are mentioned, at first hands.

THE JANUARY NUMBER of *Scribner's Magazine* opens the second year of its publication. The success of its first year is well known, and its second promises extremely well if we may judge by its prospectus of what is to come. The illustrations have steadily improved, and the publishers promise that during 1888 they will be better than ever. A prospectus will be sent to any one upon application to Charles Scribner's Sons.

R. I. PEARSON & Co., of Kansas City, publish the neatest, handiest, most complete pocket appointment book that has come to our notice. It is furnished as a premium to subscribers for the *Western Dental Journal*. That publication really needs no premium to commend it to the profession, and the appointment book needs no *Journal* to further its reception, but both together should be irresistible to western dentists.

DR. L. D. CAULK, manufacturer of "Caulk's Filling Materials," and publisher of "Caulk's Annual," has removed his office and salesroom to Nos., 1305 and 1307 Arch Street, Philadelphia, Pa., although his laboratory still remains in Camden Del. The Doctor has greatly increased his business facilities, and we are informed that his specialties find a market in every civilized country in the world.

SUGAR OF MILK has the property of rapidly dissolving the calcium deposits between the teeth. It therefore forms a valuable dentifrice.—*Exchange*.

Nitric acid has the same property. Is it therefore a valuable tooth-wash? People should not talk of what they do not understand. Sugar of milk has no such property as is claimed for it.—*EDITOR*.

DR. E. D. DOWNS, of Owego, whose leg was amputated at the hip for a disease caused by an injury received from his dental chair, is slowly recovering, although for some time his prospects for life were very poor indeed.

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No. 2.

NOTE.—No paper published or to be published in another journal will be accepted for this department. All papers must be in the hands of the Editor before the last day of the month preceding that in which they are expected to appear. Extra copies will be furnished to each contributor of an accepted original article, and reprints, in pamphlet form, may be had at the cost of the paper, press-work and binding, if ordered when the manuscript is forwarded. The Editor and Publishers are not responsible for the opinions expressed by contributors. The Journal is issued promptly, on the first day of each month.

Original Communications.

CONTRIBUTIONS TO THE HISTORY OF DEVELOPMENT OF THE TEETH.

BY CARL HEITZMANN, M. D., AND C. P. W. BÖDECKER, D. D. S., M. D. S.

CONTINUED FROM PAGE 5.

VI. LITERATURE.

The literature of the development of the teeth is so extensive that the writers have found it almost impossible to give full abstracts from every author. Some of the works, too, were not at our immediate disposal, and for this reason we have been unable to preserve the proper succession or order of publication.

In the *Natural History of the Human Teeth*, London, 1778, John Hunter noticed the dental sacs. He also mentions that the incisors and cuspids begin to ossify on their edges about the sixth or seventh month of uterine development.

Delabare, in 1805 (*System Handbuch der Zahnheilk.*, Von G. Carabelli, Wien, 1844, page 139), says that he has observed small openings upon the rim of the jaws, which represent the inlets to the

dental sacs. He regards the enamel as a living substance receiving blood-vessels and provided with sensibility.

In the *Natural History and Diseases of the Teeth*, by Joseph Fox, London, 1814, we find an account of the formation of teeth on page 1, as follows: "As soon as the ossific deposit commences in the cartilaginous parts of the embryo, both jaws are filled with small membranous sacs. When the gum which covers the alveolar groove of a fœtus of four months' old is stripped off from the bone, small processes or elongations from the inner surface of the gums may be directly perceived. These are the first appearances of the pulps from which the teeth are formed." Fox also observed that the tooth-sacs about the fourth fœtal month were very soft and represented the shape of the tooth. He also observed that ossification of the tips of the incisors and cuspids, as well as the points of molars, commences about the fifth or sixth month, and gradually extends itself over the whole surface down to the neck of the tooth.

One of the first writers who gave definite information concerning the development of the teeth was Fr. Arnold (*Medicin. Chirurg. Zeitung. Insbruck*, 1831, Bd. II., page 236), who was the first to observe that the tooth sacs (papillæ) were derivations from the oral mucous membrane. He also mentions a peculiar occurrence in the mouth of a new-born infant, which seems to be identical with what the writers have described and depicted in Fig. 35. He says, "Once I observed in the mouth of a new-born infant, behind the protruding ridge of the gums, several openings which led to the sacs of the front and eye-teeth, and which usually are found closed up by the mucous membrane before birth."

These assertions were criticised by Purkinje and Raschkow in 1835, who maintained the opinion that the dental follicles were formed independently of the mucous membrane of the gums. Raschkow, in a foot-note appended to his researches, remarks that he has observed that the enamel organ receives blood-vessels in certain parts, and believes the parenchyma of the organ to be pervaded by capillary vessels. The conclusion which he deduces from this observation is that the enamel organ was from the beginning joined to the capsule. (Nasmyth, page 109.)

Thomas Bell (*The Anatomy, Physiology and Diseases of the Teeth*, Philadelphia, 1837, page 53) observed in embryos about two months old, an extremely soft, jelly-like substance, lying along

the edge of each maxillary arch, which in the third month he found of firmer consistency, and contained in a shallow groove, and further on says: "These pulps are the rudiments or bases upon which the teeth are formed, and each is partially enclosed in a membranous sac." At the fourth month, if the sac be opened, a small point of ossification is found to have been deposited, and this is the commencement of the formation of the bony substance of the teeth. The ossific matter is secreted, not from the pulp itself, but from an extremely delicate, thin, vascular membrane, which covers its surface, and is closely attached to it by vessels." He also noticed that the sac consisted of two lamellæ.

Of the formation of the enamel, Bell says: "At this time a remarkable alteration takes place in the substance of the sac, which becomes thickened, and much more vascular. * * * It now begins to pour out from its internal surface a thickish fluid, which is speedily consolidated into a dark, chalky substance, and afterwards becomes white and hardened by more perfect crystallization. This is the enamel."

A. Nasmyth (*Researches on the Development, Structure and Diseases of Teeth*, London, 1839) endorsed the statements of Arnold and Goodsir. He also gives a description of the enamel organ, describing it as being composed of a variety of cells as to size and shape, and also notices the minute granules in the interstices of the cells, (basis substance of the stellate reticulum). He believed that all the cells of the enamel organ were of the same nature, and regards the narrow and oblong cells, which lie upon the dentine papilla, as in a state of preparation for the reception of the calcareous salts. These cells he believes to have arisen from the oval ones, and those from the flat triangular cells. He also mentions the external epithelial cells of the enamel organ.

He describes the Nasmyth membrane to be the remnant of the dental capsule, and to be continuous with the cementum, on the outside of the fang of the tooth, "which latter is itself continued into the chamber of the tooth." (Page 114.)

Richard Owen (*Odontography*, London, 1840-1843) observed that the matrix of the mammalian teeth sinks into a furrow and becomes enclosed in a cell in the substance of the jawbone. The cement he regards as the result of ossification of the tooth capsule. He also mentions that the permanent teeth are derived from the

germs of their predecessors. On the formation of dentine, he mentions that the cells on the surface of the pulp are more numerous, and that they are arranged in lines.

Ph. Fr. Blandin, of Paris (*Anatomy of the Dental System*, Baltimore, 1845, page 38), draws attention to the dental follicle, and compares it with the follicles of the hair and feathers. He describes them as little sacs which are formed by depressions of the mucous membrane. He further says: "The dental organs are essentially composed of two elements, the secreting portion, and the portion secreted." The former includes the matrix follicle and the bulb or germ, and the latter portions of the tooth itself.

Sir John Tomes (*A Course of Lectures on Dental Physiology and Surgery*, London, 1848), to whom the profession is greatly indebted for his accurate scientific observation in this, as in many other subjects (Lecture 4, page 68), quotes the observations of Goodsir, describing the formation of the primitive dental groove, at the bottom of which a papilla is formed, and then, as he expresses it, the walls of the groove send out lamellæ toward each other, which unite, and by these means the papillæ are enclosed in follicles. He then mentions the different changes of shape the papillæ undergo from the club-shaped enlargement to the perfect enclosure of the tooth. About the fourteenth week Tomes says the primitive dental groove disappears and is succeeded by another groove, which, however, is situated on a little higher level, and is destined to furnish the papillæ of the ten anterior permanent teeth.

In the next lecture (V, page 82) he carefully considers the development of enamel, dentine and cementum, and after a brief mention of the cell theory, as accepted at that early time, he begins to consider the development of the dentine, and says that previous to its formation the inner surface of the sac (enamel organ) becomes separated from the surface of the pulp, the intervening space being occupied by a soft, gelatinous, granular matter, the formative pulp for the development of the enamel. He further says that at that time we find two formative pulps, one for the dentine, the other for that of the enamel in one tooth sac. For convenience sake he gives the development of dentine in three stages. The first he calls the alveolar, the second the cellular, and the third the linear stage, when the cells arrange themselves in rows and become what has later been termed odontoblasts. In regard to the process of

calcification, he says: "Each cell after falling into line divides into two or more in its length, and each division elongates. A central nucleus or space is seen in each cell, which lengthens with the cell. The cells, by their increased length, become placed end to end, and ultimately unite, and the elongated central space of each individual, by a further development, joins and opens into those of the super-imposed cells. In chapter II, "On the Development of Dentine," the writers have described (see Fig. 15, C. D.) close to the nearly calcified dentine a light zone composed of non calcified basis-substance of dentine, which seems to have been observed by Tomes at that early time, for on this subject he says: "Covering the pulp is a transparent membrane closely united to the external cells. This membrane, which forms the exterior of the dentine, is the first to undergo calcification." He regards the basis-substance of the dentine identical with that of bone.

On the development of enamel Tomes says that he observed minute blood-vessels freely traversing the enamel-pulp in its first or reticular stage, but the writers have only met with blood-vessels after the breaking down of the external epithelium (see Figs. 5 and 6), in which stage Tomes did not notice them. He then describes the stellate reticulum and the stratum intermedium, and remarks: "The two tissues described graduate into each other, the reticular forming at an early period nineteen-twentieths of the whole mass, and, I believe, originally, all of it. With the gradual advancement of development it disappears, leaving the stellate tissue, and this too, at last, yields its place to a columnar tissue—the enamel matrix. * * * Hence we have existing at one time three formative tissues; the first to be transformed into or give place to the second; and the second into the third, and that into enamel." Concerning the function of the stellate tissues he is of the opinion that they prepare the nutrient fluid for the peculiar wants of the columnar tissue and the development of the enamel. Of the process of calcification, Tomes speaks as follows: "The enamel cells being formed in line, eventually become confluent. * * * The nuclei, from the first, very small, are altogether lost in the formation of the fibers, or exist as very fine tubes passing through the length of each. The lateral union is at this time very slight. * * * The enamel continues for a considerable time to increase in density. * * * Recently developed enamel, from the innumerable inter-

spaces between the fibers, is very opaque or pearly. The interspaces, however, become gradually less numerous, and at last, in perfectly formed enamel, they are almost entirely lost. Thus we have what may be termed a progressive growth towards the perfecting of the tissue of the enamel after the appearance of the tooth through the gum—a fact which has, I think, been overlooked, especially by those who have considered that the dental tissues are devoid of vitality." Of the formation of cementum he mentions that its formative organ is the capsule (sac) of the tooth, but believes that the cementum is formed by a direct process of calcification, a theory at that time universally admitted. He says (page 105): "The nuclei (of the cells) being transparent, present the appearance of cavities, which, indeed, they ultimately become. The parietes of the cells and the interposed granular tissue receive the phosphate and other salts of lime."

A. Kölliker (*Entwicklungs-Geschichte des Menschen und der Höheren Thiere*, Leipzig, 1879), in describing the enamel organ, says that it belongs entirely to the epithelial tissues, and observed the two layers—the internal and external—epithelium of the enamel organ. He says that the stellate reticulum, in appearance, is identical with connective tissue, but is really nothing but a peculiarly transformed epithelium. He also mentions the stratum intermedium, which, in the first stages of development, is transformed into the tissue of the stellate reticulum. He further says, that between the epithelial elements (ameloblasts), and the papilla is situated a very delicate membrane—*membrana præformativa*—which has a specific function. He also describes the transformation of the external epithelium into epithelial stems (*Epithelialfortsaetze*), between which blood-vessels originate, but at the same time states that they never enter the enamel organ. He describes the growing of connective tissue into the lower part of the enamel organ which forms the dentine papilla as well as the formation of the tooth-sac. He also observed the stratification in the enamel, which he attributes to the different periods of its calcification.

W. Waldeyer (*Manual of Histology*, by S. Stricker, New York, 1872), in his description of the development of teeth (page 339), after mentioning the formation of the primitive groove, describes the enamel organ originating from the oral mucous membrane, at first appearing like a short tubular gland. He explains the

further development as follows: "The spheroidal cells forming the central part of the enamel germ begin to increase with rapidity, so that the germ * * * assumes the form of a club." He then describes the manner in which the club grows downward till it has attained the shape of a cup, which envelops the dentine papilla. He mentions the disappearance of the epithelial cord at a later period, but does not state what becomes of it. He observed that the enamel cells (ameloblasts), which rest upon the dentine, with their extremities, become elongated. He also noticed the external and internal epithelial layer, and between these the stratum intermedium, which latter gives rise to the stellate reticulum. On this subject he says further: "The cells lying in immediate contact with the epithelium (stratum intermedium, Hannover), retain their original form, and from these a continuous development of enamel cells, as well as of gelatinous epithelial tissue, appears to proceed." Waldeyer is of opinion that the basis-substance of the enamel organ only serves a mechanical purpose, and further states that before the formation of the enamel is completed, both the stratum intermedium as well as the epithelial and gelatinous tissue atrophy. Nasmyth membrane he believes to be an epithelial formation, which is derived from the external epithelium of the enamel organ. In reference to the calcification of enamel, he believes that the enamel prisms are the result of a direct calcification of the enamel cells (ameloblasts), basing his assertions upon the fact that some of these cells, when detached from young enamel, exhibited the Tomes process. He believes that the light zone, described by Kölliker and Huxley as the membrana præformativa, is nothing but newly-formed enamel, and is detachable, an artificial product. He observed the stratification of the enamel, and described the upward growth of the tooth-sac, which latter furnishes the cementum of the root of the tooth. The process of ossification of the dentine he considers identical with that of ordinary bone. In regard to the formation of dentine, he entertains the view that the dentinal fibers are the central remains of the odontoblasts, while their peripheral portion becomes basis-substance. He also observed that the odontoblasts were connected with each other by fine processes, and believes that each dentinal fiber is formed by a coalescence of several odontoblasts.

One of the best descriptions of the development of teeth, as well

as a very complete summary of the literature on this subject, is that of G. Hertz (*Virehow's Archiv*, 1866, Bd. 37, Heft 3, page 212). He gives a careful description of the formation of the primitive furrow and epithelial hill (*Zahnwall*), after which he describes the development of the tooth-sacs as well as that of the papillæ. He attributes the club or cup-shaped enlargement of the enamel organ to the upward growth of the dentinal papilla. In regard to the formation of the permanent teeth, Hertz is of the opinion that their germs originate either from the neck of the epithelial cord near the oral mucosa, or directly and separately from the latter at a place near the primitive fold of the temporary tooth. Hertz also gives a good description of the stratification and discoloration of the enamel, which was first noticed by Schreger and Retzius, and later by Czermak, Kölliker and others. Hertz is of the opinion that the origin of this peculiar stratification and pigmentation of the enamel must lay in the altered condition of the enamel prisms. Such enamel, when treated with acids, would leave an organic residue which did not possess the clear aspect that he usually observed in other (healthy) enamel. The residue from the former presented fine, dark granules, which Frank Abbott has announced to be enlarged and beaded enamel fibers.

Hertz then, after giving the different views of Todd, Bowman, Hannover, Purkinje, Raschkow, Schwann, Huxley, Lent, Kölliker, Waldeyer and John Tomes, in regard to the formation of enamel, says, "After careful consideration of all (the work quoted above), I endorse the direct transformation of the enamel cells into enamel prisms." But he says on the next page (294) that he cannot deny, that in young forming enamel the transition from the enamel cells into enamel is apparently not a direct one, as he observed, especially on specimens treated with chromic acid, a small light zone which, perhaps, may appear like a membrane which was situated between the formed enamel and the enamel cells.

In the process of calcification he agrees with Tomes, that first the periphery and then the center of the ameloblasts become impregnated with lime-salts. His views in regard to the stratum intermedium are that this layer is the matrix of the enamel organ for the benefit of the enamel cells (ameloblasts), and says: "By the formation of the stellate reticulum its development is stopped only for the time being, as this tissue and in this condition only serves

as a nutritive substance, at least in the parts situated near the internal epithelium, for the formation of the enamel cells and enamel prisms, and later, through a new formation of cells, it contributes directly to the formation of the enamel. In this way the whole stellate reticulum is transformed into the stratum intermedium, and when the stellate reticulum has been used up, the formation of the enamel is completed." Hertz is of opinion that Nasmyth membrane is developed from the remains of the external epithelium. He also observed the protoplasmic bodies situated in layers (interzonal) between the dentine and enamel.

Of the development of dentine he gives (page 314) an excellent grouping of the views of the different authors as follows:—

1. "The basis-substance originates from fibers which are formed by the (dentine) pulp. The dentinal canals represent the spaces between these fibers."—(Raschkow.)

2. "The lengthened and obliterated nuclei of the superficial layer of the pulp form the walls of the dentinal canaliculi, in the surrounding of which the basis-substance is formed, either by the cells alone, or by them together with the intercellular substance."—(Henle, Owen, Hannover, Tomes.)

3. "The basis-substance originates from the cylindrical cells, which blend and ossify together, and the dentinal canaliculi are the remains of the cell cavities."—(Zellenhöhlen, Kölliker.)

4. "The cells form the dentine canaliculi in such a manner that their processes are transformed into the canaliculi around the neighborhood of which the lime-salts are deposited. This theory was first advanced by Schwann, but afterward abandoned, and later again endorsed by Ient."

5. "The dentine cells and their processes represent the dentine fibers. The dentinal canaliculi have no walls. The basis-substance is a secretion of the dentine cells, or the tooth-pulp."—(Kölliker.)

6. "The majority of the protoplasm of the dentinal cells is transformed into a calcified connective tissue basis-substance, surrounding the dentinal canaliculi, a small portion of the protoplasm remaining soft and unaltered as dentine fibers."—(Waldeyer.)

"The last (Waldeyer's) assertion appears at first the most explicable, but after all that I have seen, I have to endorse the opinions of Kölliker, which have been published lately, and which, on page 316, he (Hertz) states to be as follows: 'The dentinal fiber origi-

ates directly from the odontoblasts in such a manner that the peripheral portion of the odontoblasts forms the outer wall of the dentinal fibers, while the protoplasm of the cell forms the central portion of the fibers. The basis-substance is the chemically altered and calcified intercellular substance of the odontoblasts in which the dentine canaliculi are present as channels without walls.' "

On the development of the cementum this author says nothing but that his researches have not been completed.

(TO BE CONTINUED.)

DENTAL EDUCATION IN GERMANY.

BY W. D. MILLER, BERLIN.

CONCLUDED FROM PAGE 11.

Many German Dentists have, in the past, gone to America to pursue their professional studies and to obtain their doctor title. It would be very unjust to suppose all such to be quacks, for many of them are men of good standing, with large practices, and this they claim is one reason why the American degree is so cordially detested by the Zahnärzte.

The centre of dental education in Germany lies at present in Berlin, and the progress of the Dental Institute, which was established as a department of the Royal University in 1884, has been watched with great interest. At first the institute was looked upon as an experiment; now it can be recognized as wonderful success, and the impulse it has given to the study of dentistry in Germany is no less wonderful. Previous to the establishment of the Dental Institute in Berlin, the number of students of dentistry at the University averaged about thirty-five; some years it was as low as twenty. I am also informed that the courses and lectures conducted by Prof. Albrecht, who, for many years had charge of the dental polyclinic, were attended by very few students, and sometimes only half a dozen hearers would be present, very seldom but two or three. The professor would then sit down by them on the bench and give his lecture in the form of a quiet little chat. The accommodations in the clinic itself, were almost *nil*. The number of stu-

dents matriculated in 1883 was forty; in 1884 it immediately rose to sixty, and last semester it had risen to 147; this semester the number has not yet been made known. I estimate it at about 165. The number of students who took the operating course, alone, the first year in the dental institute, was fifteen. This number has gradually increased, till in the present semester it has reached fifty-eight, which is the highest possible number that we can accommodate. Many more applied, but we were obliged to refuse the applications, simply for want of room. The increase in the other departments has been equally great. The work done at the dental institute is divided into three departments:

(1). Extractions and minor surgical operations, in charge of Prof. Dr. Busch.

(2). Conservative treatment of the teeth, in charge of Profs. Drs. Miller and Poetsch.

(3). Mechanical dentistry, in charge of Prof. Saer.

The conditions for admission to the study of dentistry are those stated above, viz: Reife für Prima in a German gymnasium, or first-class Real Schule. With this certificate students are matriculated for four semesters in the philosophical faculty of the University. Those who desire to study more than four semesters must, before the end of this time, apply to the Curatorium of the University, and receive the privilege of studying two semesters longer.

The charges for matriculation are very small—about five dollars—but each course must be paid for separately. The course in extraction costs about twelve dollars, that in operative dentistry the same, while mechanical dentistry costs thirty dollars. A course of lectures, three per week, without demonstrations, cost five dollars.

The clinic conducted by Prof. Busch is, nominally, daily, from 11 to 1 o'clock, but it is very seldom that the material is finished at 1 o'clock. The work done is principally extraction, as Prof. Busch does not encourage the students in the view that the dentist should also be capable of performing resections of the jaw, removing cancer and operations of that nature. In this he is undoubtedly right. These operations belong in the domain of surgery, and no person who has not had a thorough surgical education has any business to trifle with them. Consequently, besides extractions, the operations performed are chiefly incisions of abscesses, treatment of diseases of the antrum, of cysts, and minor operations of that kind. Prof. Busch

is himself present the whole time, and personally superintends each operation.

The clinic for extraction presents a marked contrast to that in most colleges in America. It is sought daily by about forty to fifty patients from the lowest classes, the number of teeth extracted daily averaging about seventy-five. Three or four narcoses are made daily, almost exclusively with nitrous oxide. Some ten or twelve extractions were made under cocaine-anæsthesia. In every case, however, the results were unsatisfactory, so that this anæsthetic has been abandoned. The operating rooms are open daily from one to six in summer, and from twelve till dark in winter. The rooms accommodate, with difficulty, twenty-eight chairs, and each chair is occupied by two students, who can arrange between themselves as to the hours in which each is to operate. There is usually an abundance of material, so that on some days all of the twenty-eight chairs are occupied, and the rooms present an aspect of greatest activity. I myself am always present on Monday, Tuesday and Wednesday, from two to four, and Prof. Paetsch at the same hours on Thursday, Friday and Saturday. One assistant and one demonstrator are daily present. Both of the professors, as well as the assistant and demonstrator, do a great deal of work in the clinic, so that each student has repeated opportunities of seeing various operations performed, as well as receiving directions during the performance of the operations himself. We endeavor to give as thorough instruction as is possible in the time allotted, in filling with non-cohesive as well as with cohesive gold (pellets, cylinders and foil), with tin and gold, and with the various plastics; much attention is also given to the conservative treatment of the pulp, and to the antiseptic treatment of root canals. I think I may say, with all impartiality and proper respect for the institutions of my fatherland, that the instruction here received by the students quite as well qualifies them *for the practice of dentistry in Germany* as that which they would receive in an equal length of time in any dental institution of America.

In educating a man for any occupation some regard must be had to the circumstances under which he is to carry out the same. A young man brought up in the belief that everything must be done with gold, and that, too, with "hard gold," and that in every case the tooth must be restored to its original shape, and that the gold

must have exactly the same density throughout, and a surface as bright as a mirror, *might* make a living in New York, or some of the larger American cities, but if he were put into a German city of 10,000 to 40,000 inhabitants, I doubt very much if he would be able to collect a practice. The great majority of the students from the dental institute set up in practice in cities where it is absolutely necessary for them to make many operations in plastic materials, and where, if they do gold work, they must do it at inferior prices, and where they will be obliged to sacrifice to the forceps many teeth which could be saved. The mass of the German people must first be taught the value of good conservative dentistry, before they will put any confidence in it, and before they will be willing to pay for it, and this teaching is not a matter of a few days, but of many years, and they must learn by *experience* that fillings can be made which will not fall out the next day, and that it is not necessary to extract a tooth as soon as it becomes carious.

The extension of the freedom to practice dentistry to all, regardless of qualification, and the too little attention paid to the practical side of the education of the Zahnärzte, has been a great hindrance to the growth of conservative dentistry in Germany. The many dabblers in dentistry, Zahnartists, Zahukünstler, Tooth-healers, etc., all over Germany, as well as many of the Zahnärzte, who, as far as their dental education is concerned are little more than Zahntechniker, have for many years been inculcating by their practice a lesson which can be counteracted only by years of successful practice in the conservation of the teeth. While we, therefore, endeavor to prepare our students for conducting a first-class practice, they must also be able to conduct second-class practices; *i. e.*, practices among the less wealthy classes of people, and among people who have for centuries been brought up in the belief that there is little to be expected of conservative treatment, and who do not readily "catch on to new notions." We are, therefore, obliged to give our students a broader education than would be necessary for many a practice in America, and our system of teaching, instead of producing the one-sided results which Dr. Abbott thought he might attribute to us, produces beyond doubt a more many-sided preparation than is obtained in the majority of American schools.

Every student learns to extract under the eyes and hands of the instructor. He extracts during his study many teeth himself, and

sees thousands extracted. He witnesses hundreds of narcoses with N O_2 (some also with other anæsthetics), *must himself be perfectly competent to conduct the narcosis*, has the opportunity of seeing perhaps all the diseases which the human mouth is heir to, and learns to diagnose them and operate upon such as it is desirable for the dentist to operate upon. He learns to use all the filling materials that have been found of value in dentistry; the process is demonstrated to each student separately; he must also be equally well prepared to diagnose the most important diseases of the dental pulp, and treat them accordingly; he must thoroughly understand the principles and practice of the antiseptic treatment of pulpless teeth, etc., etc. In mechanical dentistry a proportionate amount of time is spent. The student is not allowed to take a patient, pick out the places where he can insert showy gold fillings and dismiss the patient with the others untouched. He must *put the mouth in order*, and a control is kept of all the work done. The difficulty of our work is increased by the fact that we must begin with the A B C. The majority of students entering an American dental college are already able to insert a fair gold filling; here it is the exception that the beginner knows anything at all about the manipulation of gold or the preparation of cavities.

We have no clinics in the American sense of the word, and this for various reasons. (1) At the time of the founding of the institute one could have counted its friends among the *Zahänrzte* upon the fingers of one hand, and probably still have some fingers over. It would have been somewhat difficult to secure good operators for clinics, if it had been deemed desirable. (2) Our students are obliged to do a great deal of work in the four semesters, and the number of chairs being limited we would not feel justified in closing the rooms for the entire day, and thus depriving all the twenty-eight students of the much-needed exercise at the chair. All the more, as I have serious doubts as to the value of clinics for students. It is, or should be, the aim of a course of operative dentistry to instruct the student in the general or fundamental principles pertaining to the practice of dentistry. He should learn how to form the cavities in such a manner as to give the best form for retaining its filling without weakening the tooth or sacrificing an unnecessary amount of substance. He should thoroughly comprehend the properties and manipulation of cohesive as well as of non-cohesive

gold, and of plastic materials, and be able to determine, according to the conditions, which material is best adapted for individual cases. He should be familiar with the predisposing as well as the direct causes of decay of the teeth, and those conditions in the human mouth which favor the appearance of decay, so as to be able, as far as possible, to obliterate them by his operation on the tooth. He should exercise himself in acquiring a delicate touch and a firm steady hand, which is half the battle in the treatment of sensitive teeth, exposed pulps and root canals. He should understand thoroughly the character of the material he is operating upon, and the objects which it is desired to secure by the operation, etc., etc. In other words, he must be taught the fundamental principles which should be observed in the treatment of every tooth, no matter what material or which method is employed. These things he will learn better by working two or three hours himself, under the eyes of the teacher, than by spending an equal time in watching some one else condensing a certain amount of gold, often in a previously prepared cavity, the operator, perhaps, being too much engrossed with his operation to be able to give the necessary explanations which should accompany every demonstration.

I doubt, on the whole, from what I have seen of these clinics, whether the students are much benefited by them, and when they are not compelled to attend but a small per cent. put in their appearance, even at the beginning of the operation, and before it is over, as a rule, only half a dozen, sometimes only two or three, will be left. For practitioners, as well as for students who do not daily receive *practical* instruction in filling from the teacher, I hold clinics to be of considerable value, but our experience thus far has been such that we do not feel inclined to change our present system, or to introduce the clinic system in vogue in most of the American dental colleges. Nevertheless, if any one has a new method, new instrument, or a new operation which he wishes to demonstrate, he is allowed to do so. He is given a chair and a person to work upon. Those students who are free and wish to *voir* look on, but no one is compelled to stop work, put up his instruments and lose a day's work on that account.

Examinations do not take place here at the close of each winter semester, as in America, but at any time between November 1st and about August 15th, when three or four students, who have studied

the required four semesters and have the preliminary qualification (*Reife für Prima*), present a formal request for admission. The examinations are divided into four stations or stages. In the first, the candidate is confronted with a patient from the polyclinic, and is required to examine the mouth and teeth and to diagnose the cause of any trouble of which the patient may complain; also to describe the character of and give treatment for any diseased condition of the teeth or associate parts which may be present. He is examined orally for thirty minutes by two members of the examination committee, and then commits the whole matter to writing.

In the second station, the examination is written only. Here the candidate draws ten questions from a box containing 150. The questions are usually very comprehensive, so that ten, twelve, or even fourteen hours are consumed in writing the answers to them, the examination beginning at 9 A. M., and lasting sometimes till 11 P. M.

The questions are on Toxicology, *Materia Medica*, Anatomy (general and special), Physiology, Pathology, Therapeutics. The following are some of the questions:

(1.) Where do fractures occur in the upper jaw? what are the symptoms? how are fractures occasioned? how are they treated?

(2.) What irregularities are observed of individual teeth? what are the causes? what are the disturbances and diseases produced by them? how are they prevented and removed?

(3.) Nervous Trigemini; trace the course of all its branches.

(4.) Describe the structure of the mucous membrane of the mouth in general, and of the gums in particular.

(5.) Mercury—its chemical and pharmaceutical preparations.

Ten questions of this character are not quickly disposed of. The list of questions is very old, and the candidates know pretty well what they are. This matters little, however, since if they thoroughly work up 150 questions of this kind, they deserve to pass. Nevertheless, we hope to be able to prepare a new list before long. In the third station, the candidates are examined in the conservative treatment of the teeth (Miller), extracting (Busch), mechanical dentistry (Baume).

As for the examination in the conservative treatment of the teeth, its severity depends altogether upon my knowledge of the candidate.

If I have convinced myself, during the months that he has worked under my charge, that he is a capable operator, it is made very easy; if I have any doubt about his efficiency, it will naturally be made more difficult. He is obliged to make one or more operations of any nature that I may see fit to require, directly under my eyes. It may be a filling or a pulp treatment, or treatment of root-canal, abscessed root, etc., etc.

He must also perform a number of difficult extractions under Prof. Busch. Thirdly, he makes a set of teeth on rubber, a gold clasp and a pivot tooth in the laboratory of and under the eye of Dr. Baume; the last two are made on the model, not in the mouth. In the fourth station (Schluss, conclusion), he is examined orally by three examiners (one-quarter hour each) on anatomy in particular, and on any subject in practical or scientific dentistry. The marks given by the individual examiners are: (1) Very good; (2) Good; (3) Sufficient; (4) Insufficient; (5) Bad.

The mark 4 (of course also five) obtained from any one examiner in any station throws the candidate out. He can, however, try again after a period of six to twelve weeks. The shortest time in which all the stations can be completed is about two weeks.

It will be seen from the above that the examination is rather a complicated affair, and by no means very easy. During the last winter, out of the twenty-nine candidates eight were rejected in one or more of the stations. If some of the dental colleges of America would approach these figures, the effect would be very salutary to the standing of the profession.

The requirements are being gradually raised in Berlin, so that many of our less energetic students make their studies in Berlin, and then go to some other university to pass the examinations. The examination is not a university or institute examination, but a State examination, and is conducted by a board of examiners appointed each year by the State, who do not necessarily have any connection with the University.

The present examining board consists of Privy Councillor Prof. Dr. Waldeyer, (Anatomy); Prof. Dr. Busch, (Surgery); Prof. Dr. Miller, (Operative Dentistry); Prof. Dr. Baume, (Mechanical Dentistry).

The examiners do not, however, confine themselves strictly to the branches placed opposite their names. The candidate who

has successfully passed through all the stations receives a diploma, conferring upon him the title "Approbirter Zahnarzt," or "Praktischer Zahnarzt" (approved tooth-physician or practicing tooth-physician). It is at present only a title, and confers upon its possessor no particular immunity except a better standing in society, the right to prescribe medicines, administer anæsthetics, etc.

Regarding education in general, and dental education in particular, Dr. Abbott made some statements at the last meeting of the American Dental Association (see INDEPENDENT PRACTITIONER, September, p. 482), which ought not to pass unnoticed. I will, however, only say that the statements referred to are entirely wrong, and that any one who wishes to inform himself on matters of education in Germany would do well to look to some other source than the one referred to. It is not possible to establish a dental school in a place where practical dentistry is not far advanced, and bring it to perfection in three years. There is much room for improvement; nevertheless, every one who has visited our school has been astonished at what we have already accomplished. Dr. Harlan, who visited the Institute a year and a half ago, says that the operations were "quite equal to the average in our country," *i. e.*, in America, which, considering the difficulties with which we have had to contend is saying a great deal. Our students do not perform as extensive operations as are often indulged in by the students in American colleges, but in the way of care, exactness and thoroughness in preparing the cavity and inserting the material, we have had students whose work, I think, very nearly, if I may not say quite, equaled anything that I have seen done by the students in America. These results, I am inclined to think, are largely to be attributed to the methods of teaching here in vogue, and to the individual efforts of the teachers in this department.

As to whether it would be expedient to increase the requirements for admission, as has been talked of, or to demand for admission to American colleges a general education equivalent to that now required here, is a question on which I may offer my views at another time.

Also the recent dental legislation in Germany, the warfare upon the Dr. title (D. D. S.), and the standing of various American dental colleges in Germany may receive attention later.

THE EXTRACTION OF THE FIRST OR SIXTH YEAR MOLARS.

READ BEFORE THE CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY,
DECEMBER 19, 1887.

BY DR. G. W. WELD.

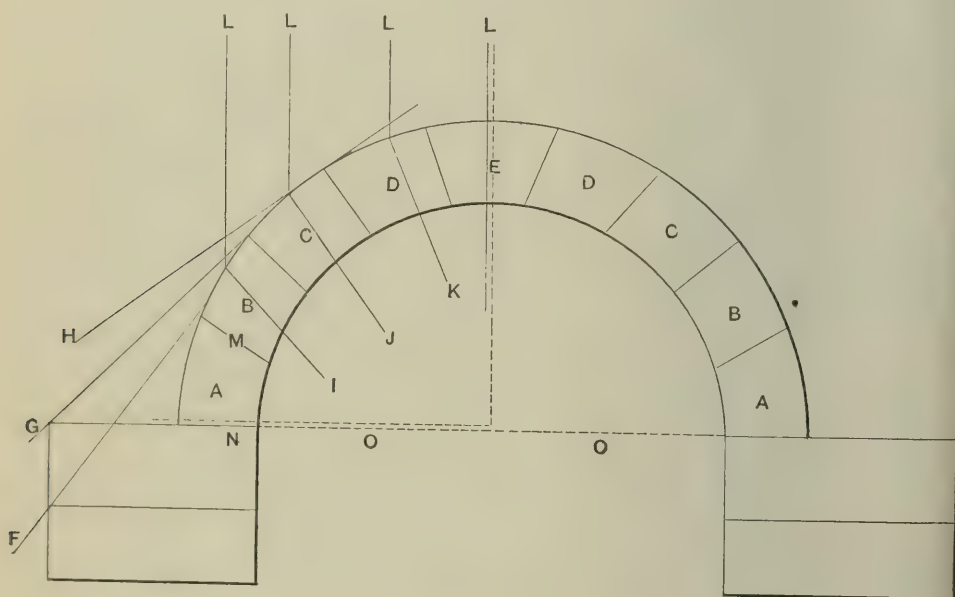
A paper entitled "The Significance of the Natural Form and Arrangement of the Dental Arches of Man, with a Consideration of the Changes Which Occur as a Result of Their Artificial Derangement by Filling or by the Extraction of the Teeth," by Dr. I. B. Davenport, of Paris, was read before the New York Odontological Society, on Tuesday evening, April 12, 1887.

The paper above referred to illustrates, more than any study which the writer has ever considered, the injury which is sometimes inflicted on the dental arches of man by the premature extraction of this tooth. Indeed, from an examination of the models and drawings that accompanied the paper in question, one is almost forced to accept its conclusions, viz., that herewith those practitioners of dentistry who have been in the habit of extracting this tooth for the purpose of regulating the teeth have only made themselves conspicuous in error, and in the end produced an irregularity more difficult of correction than that which previously existed.

The importance of this tooth in completing the natural form and arrangement of the dental arches is fully illustrated by a consideration of its absence or loss in connection with the laws of the equilibrium of pressures. These laws were virtually embraced, if not expressed, in Dr. Davenport's theses, and it is concerning these laws—a repetition of the same sounds, a re-echo, so to speak—that I invite your attention this evening.

In civil architecture, as, for instance, in the construction of an arch, mathematicians have endeavored to render the subject easy of comprehension by introducing certain pre-supposed conditions. Thus, in treatises on the theory of the arch, the structure is regarded as consisting of a course of arch-stones resting on abut-

ments and carrying a load which is supposed to press only downwards upon the arch-stones; and also that in such cases cohesion and friction are entirely lost sight of, and the investigation is conducted as if the stones could slide freely on each other. For example, if the line of pressure of one stone against another be across their mutual surfaces perpendicularly, there is no tendency to slide; and if this condition be adhered to throughout the whole structure, there must result complete stability. But if under any circumstances the line of pressure should cross the mutual surfaces of the arch-stones obliquely, the tendency to slide must be resisted only by cohesion, and the stability of the arch would at once be impaired. It is now, I believe, generally admitted that the line of pressure on an arch is perpendicular and at right angles to the horizontal line of base.



A simple stone arch, similar to that represented in the above diagram, is self-supporting only when the two haunches A. A. are secured by an iron tie rod O. O., unless they (the haunches) are sufficiently heavy to withstand the thrusts. The line of pressure is vertical at the centre of the keystone E., but becomes more and more oblique as the stones B. B. are approached, the tendency being to cause it to kick out at the haunches A. A. This is when

the arch sustains no weight more than the stone blocks composing the arch. In setting the arch the stones, A. A. and B. B. would hold themselves in position without cement by natural friction of surfaces, if the joint M. did not make an angle with the horizontal line N. (at the springing of the arch) of more than twenty degrees; stones C. C. and D. D. would slide off and could only be held in position by the insertion of the keystone E.

When the arch sustains a load equally disposed above it, the thrust is, of course, perpendicular at the keystone, and also at all other points until it strikes the arch itself, where the tendency is to slide off at a tangent, as indicated in the lines F. G. H., causing the abutment to kick out, if it is not strong enough to withstand the thrusts. In case sufficient material is piled above the arch (supposing the lateral supports are sufficiently strong) it would undoubtedly first crush the stones C. C. If there was more weight at the sides than over the keystone, the arch would fall at the central point by the crumbling of the key.

A well-constructed stone arch, properly cemented, becomes practically a single stone, and fails at its weakest points when overloaded, these points being, as above mentioned, at C. C.

Let us now consider the dental arch—an arch composed of teeth instead of stones—and endeavor to point out the effect which follows the removal of the first molar.

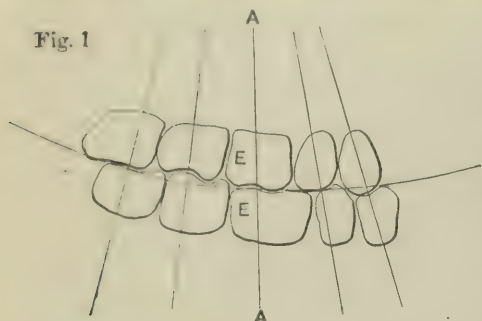
* In an article recently published in the "American System of Dentistry," entitled the Geometrical and Mechanical Laws of the Articulation of the Human Teeth, Dr. Bonwill very truly says that in order to comprehend what constitutes true articulation of artificial teeth, it becomes necessary to study the anatomy of the human jaw and its functions.

"The study of this one part of the head and jaws shows one of the most striking designs of an architect; and when studied it will be seen that every part of our frame is made by a positive law and to subserve definite purposes, such a law being in consonance with geometry, physics and mechanics. We must see the true use or function of the jaw and the teeth, and the food destined for us and

* "The Geometrical and Mechanical Laws of the Articulation of the Human Teeth. The Anatomical Articulator," by W. G. A. Bonwill, D. D. S.

how it should be communicated. There is no chance work about it. Law and order pervade everywhere."

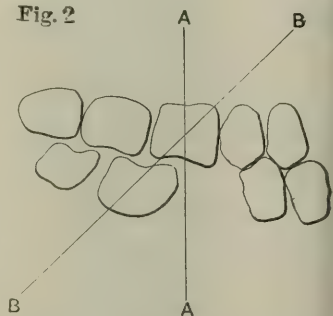
Fig. 1



of the equilibrium of pressures is as fully applicable as in the finished architectural structure of a simple or complicated arch. In the simple arch we find the line of pressure to be perpendicular on the keystone, and that whenever the line of pressure of one stone against the other was across their mutual surfaces perpendicularly, there was no tendency to slide, and that there was complete stability. In the complete dental arch the line of pressure or thrust is also perpendicular to the axis of the roots of the teeth.

In the incomplete dental arch, or after the removal of the first molar, particularly of the lower jaw, the natural form and arrangement of the teeth is interfered with and impaired. For example, when the first inferior molar is removed (see Fig. 2) the superior and first molar being left in the arch, we find that the posterior edge of the first superior molar comes in contact with the anterior edge of the second inferior molar, causing a line of pressure or thrust that is not perpendicular to the axis of the roots of the second and third molars. Under such conditions, with a natural tendency of the second and third molars to slip forward, one of two things must happen; either the foundation of the setting must be sufficiently strong to resist rotation, or disarticulation must occur. Unfortunately, the foundation or setting in the absence of the first molar is materially weakened, so that when the line of pressure of one tooth against another is not in harmony with their mutual surfaces, or when the pressure or thrust is directed against the axis of the roots of the remaining molars, their crowns

Fig. 2



are tipped forward, the axis of their roots is changed, disarticulation occurs and the once beautifully formed arch becomes a wreck. The condition is similar to that represented in an arch that is not self-supporting, *i. e.*, when the haunches are insecure, or are not sufficiently heavy to withstand the thrusts.

*Dr. Guilford, in a recent article on Orthodontia, referring to extraction for irregularity, states that he is in the habit of selecting "the one nearest and posterior to the one out of position." This rule, which is to be commended, would necessarily at times point to the extraction of the sixth



Deformity from extraction of sixth year molar after the eruption of the twelfth year molars.

year molar; but, nevertheless, the principles involved in the preservation of the arch are not changed, and the selection of any other tooth for extraction back of the cuspids must, as a rule, do far less injury to the setting.

It has been argued that this tooth, being the least permanent of all the permanent teeth, should generally be selected as the one to be sacrificed. But the advocates of this theory seem to forget that this tooth works harder, and endures more neglect and adverse conditions than any other tooth in the head. Think of a tooth living in the mouth during the trying years of childhood, and subjected constantly to all sorts of unfavorable conditions, such, for instance, as the presence of decaying teeth, a lack of cleanliness, a vitiated saliva, acid eructations from the stomach, neglect of parents, and in many cases indifference on the part of the dentist regarding its importance. No wonder that statistics show it to be less permanent than the so-called permanent teeth. But could the bicusps or the second molars, for instance, run the same gamut and suffer less? Let the practitioners who uphold this theory first show that the first molar does not suffer and endure more than

* Orthodontia, by S. H. Guilford, A. M., D. D. S. *American System of Dentistry*, Vol. II, p. 328.

the other teeth before they question its constitution and draw the line in favor of extraction.

But we are told that the age at which the patient undergoes the operation has much to do with the result, *i. e.*, if the molar in question be extracted at an early age—say in the seventh or eighth year, or soon after its eruption, and before the eruption of the second molar—there will be found in after years a translation instead of a rotation of the remaining molars; in other words, the space formerly held by the first molar is occupied by the second, and in consequence the line of pressure is perpendicular to the axis of the roots, and the damage to the arch is materially lessened. Admitting, for the sake of an argument, that this statement is true, and that it can be demonstrated that a modified rotation or complete translation is the result of early extraction, we are led to inquire what benefit is conferred upon the patient. In either case there is a deprivation, for if this tooth be extracted at the age of seven the patient is virtually without proper teeth, so far as mastication is concerned, for a period of four or five years, or until the second molars are erupted. The four first molars make up a whole set of teeth for a young person. Their absence from the mouth during childhood involves the loss of nutrition; it presupposes indigestion, dyspepsia, the lack of proper food assimilation, and a deterioration in health. Dr. Carl Heitzmann spoke true words indeed when he said that “the dentist who would try to prevent future disease by extracting a tooth plays Providence, and we all know this is a dangerous play.”

In conclusion it may be said of the sixth year molar :

I. Its title to longevity can only be questioned under neglect and abuse.

II. It is the keystone molar; with it the integrity of the arch is preserved; without it the usefulness of the arch is impaired, if not destroyed.

III. Its extraction at an early period signifies a loss of masticating surface that is absolutely detrimental to the health and comfort of the patient in early life.

IV. In view of the prominent position it occupies in the arch and its relation and influence as a just poise or balance in the distribution of the varied strains incident to mastication, its extraction can only be considered a physiological mistake.

Reports of Society Meetings.

NINTH INTERNATIONAL MEDICAL CONGRESS, WASHINGTON D. C.
SEPTEMBER, 1887

SECTION XVIII, DENTAL AND ORAL SURGERY.

REPORTED FOR THE INDEPENDENT PRACTITIONER, BY "MISS. M. W. J."

CONTINUED FROM PAGE 29

THURSDAY AFTERNOON SESSION.

Dr. W. W. Allport, of Chicago, in the chair.

Dr. E. S. Talbot, of Chicago, read a paper on the "Etiology of Irregularities of the Jaws and Teeth."

Dr. Talbot thought that comparison of the teeth and jaws of to-day with those of earlier dates showed that irregularities were more common at present, and were also on the increase, the causes for this meriting greater attention and observation. He considered the main source of irregularities to lie in the unequal development of the maxillary bones, which grow independently of each other, the different forms of irregularity met with being due to the arrested development of one or more of the separate bones forming the arches. His paper was largely devoted to statistics founded on observations made in various institutions for idiotic and feeble-minded children, arrested development of the maxillary bones with vaulted or V-shaped or saddle-shaped arches being characteristic of these unfortunate classes. As far as possible a study was also made of the hereditary or other causes of these malformations.

At the conclusion of this paper the regular order of business was suspended in honor of the presence of Dr. N. S. Davis, President of the Congress, who was introduced to the Section by President Taft, as the one individual above all others to whom the dental profession was indebted for the position it occupied in the International Medical Congress.

Dr. Davis addressed the Section. He said the day had gone by for founding sects and schools on theoretical dogmas; that medicine, to be worthy the name of a science, must be founded on the scientific investigation of accumulated facts, and conclusions drawn by inductive logic; that the dental branch did not differ from the other departments, all aiming at the same goal and through har-

monious action, attaining a scientific plane. He said that as long ago as 1865 he had said that the teeth and the jaws were as important as the eye, the ear, or any other part of the human organism, and a knowledge of how to treat these diseases required the same scientific knowledge of the principles of medicine that any other branch demanded. He hoped to live to see the last vestige of the so-called "schools of medicine" abolished; when there should be no homœopaths, no eclectics, no allopaths, but all stand on a broad platform as doctors of medicine, without any pathy, as co-workers in the great field of science.

Prof. Busch, of the Dental Department of the University of Berlin, who had arrived during the address of Dr. Davis, was introduced, and expressed his gratification at what he had just heard; he said that he was laboring to secure the same recognition in Germany, and not without hope of success.

Dr. E. H. Angle, of Minneapolis, read a paper entitled "Notes on Orthodontia, with a New System of Regulation and Retention." He said that in the work of regulation but five movements could be made—forward or backward, and inward or outward in the line of the arch, and partial rotation, these being all governed by the same principles, and easily accomplished by means of jack-screws for pushing, traction-screws for pulling, and a simple rotating appliance of piano wire bent at one end into the form of a hook. The teeth to be moved by Dr. Angle's method have a band cemented around each one, and also on the teeth of resistance, a piece of joint wire one-fourth of an inch in length being soldered to each band. This he calls "banding and piping" the teeth. A piece of gold-plated wire is threaded through all the pipes around the arch, against which the base of the jack-screws, etc., is applied, modified in different ways to suit the case in hand. The system seemed very simple and yet most effectual. The methods of applying the force were, in many instances, exceedingly ingenious, and yet uncomplicated, and the reading of the paper was heartily applauded.

In the discussion of this paper Drs. Farrar, New York; Morrison, St. Louis; Brown, Flushing, L. I.; Talbot, Chicago; and others, denied that the system of Dr. Angle was either new or original. Drs. Haskell, of Chicago, and Bailey, of Minneapolis, thought that he had made new and original applications of old principles, and in so far his method was new.

Dr. W. C. Barrett objected to the discussion, as foreign to the work of the Section, which should be restricted to the consideration of principles and not appliances. He said that this Congress was not a court before which to try and settle questions of priority of invention.

He was seconded by Dr. Allport and upheld by the President.

Dr. Barrett said that one force which, to his apprehension, was potent in the production of peculiarities and irregularities, and not alluded to by Dr. Talbot in his paper, was simply malocclusion of the teeth. Many cases of the saddle-shaped jaw can be traced to this cause. Heredity was also a very potent factor. Dr. Barrett did not agree with the statement that the examination of prehistoric skulls showed change of type of the jaws or teeth. On the contrary, he thought there had been but very little change in three thousand years. He himself had tabulated the results of an examination of more than two thousand skulls, the most of them belonging to prehistoric races, and he had found that comparatively little change could be observed. The same diseases were prevalent three thousand years ago that we to-day are combating, and there was about the same relative number of supernumerary and of rudimentary teeth as now. Irregularities were less common, perhaps, because the mingling of types was more infrequent.

FRIDAY MORNING SESSION.

Prof. Busch, Director of the Dental Institute of the Royal University of Berlin, read a paper on "The Comparative Pathology of the Teeth, with Special Reference to the Tusk of the Elephant."

This paper was illustrated by a very large collection of pathological specimens of ivory, which were handed around for examination after Prof. Busch had pointed out and explained the different forms of diseased conditions and the probable or possible causes. In some there were defects resembling caries in human teeth, both with and without pulp connection. In some the pulp had been protected through nature's efforts, by the deposition of lime-salts, similar to the protective or secondary dentine formed in similar cases in human teeth. Some defects of a peculiar character were ascribed to the work of some boring animal, from which devitalization had resulted. Although caries is seldom present in the dentine of the larger animals, in these specimens alveolar abscess was frequent. In some specimens the pus cavity was separated from the pulp chamber by a wall of secondary dentine; others showed the

abscess in the pulp itself, with secondary dentine, rendering the chamber very circumscribed and crowded. In several specimens there was no visible sign outside of the cavity existing in the dentine; as it is impossible that an abscess should have formed in the solid dentine, it must have originated in the pulp chamber, the pressure of the pus upon the walls of the chamber creating an opening into the dentine, breaking down the canaliculi, the pathway being subsequently obliterated by the elongation of the tusk, which never ceases during life. Other specimens showed an irregular development of dentine, the lime-salts being deposited in such a manner as to form round balls, like bullets, quite separated from the surrounding normal dentine, giving the appearance of a ball in a socket; probably some process of desiccation had separated the ball from its surroundings. Dental nodules were shown in the pulp chamber, some still attached to the walls; in others the connection had evidently been severed. Another specimen showed the union of a fracture with a large callus, the healing process having been sufficient to re-establish union of the parts. This is also sometimes seen in human teeth. In one specimen an iron bullet had traversed the dentine, pierced the pulp, and lodged in the opposite side of the chamber, the pathway being filled with secondary dentine, though the outer wall had evidently been shivered and fractured. In another very interesting specimen the bullet had not penetrated to the pulp chamber, and yet the point of entrance was closed by secondary dentine. It has generally been supposed that the formation of secondary dentine was exclusively due to pulp function, but in this case it must have had its source in the peridental membrane, as the pulp had not been reached.

Prof. Busch also introduced a little novelty of great advantage in the painless, quick removal of small moles or warts. It consisted of a series of cutting cylinders of different sizes; one of the exact circumference of the mole or wart should be selected, and by a rapid rotation in the dental engine made to cut the outer skin, the remainder being clipped with scissors, any dressing for hemorrhage being applied; at the end of a few days nothing will be visible but a small white scar, scarcely perceptible. The largest size cylinder was $1\frac{1}{2}$ centimetres. Above that size it is not advisable to remove by such an operation. He passed around a bottle of specimens removed during his last course of lectures at the University, Berlin.

Dr. Wm. H. Atkinson opened the discussion of this paper. He said the overwhelming presentment of specimens represented a lifetime of observations in the workshops of ivory-workers among the refuse rejected by them as worthless, and yet so invaluable to the scientific mind as a revelation in the settlement of disputed questions in histology. His greatest regret was that he could not speak German, that he might thank Prof. Busch, in his own language, for this great contribution. He regretted, however, that he could not accept all the deductions drawn from his observations by Prof. Busch. From his own observations in the shops, he thought that old age gave the globular formations, from the debility of the building powers. We know the why of nothing, and only the *how* in a very small degree. In the globular formations, only sufficient lime-salts are deposited to complete the consolidation of a point in the centre. Concentric rings of secondary dentine subsequently formed around this point. Dr. Atkinson said that the statement that in the young African elephant the tusks are tipped with an enamel-cap, smelled as though the studies had been made on the teeth of eels; the enamel-tipped tusk was only a reminiscence of the *anguillula*, before there was an elephant; he, himself, undoubtedly developed deciduous teeth in the cetaceous stage, which were shed before he was born, but he had no recollection of his sensations and observations at that epoch. (At this point Prof. Busch, rather to the confusion of the speaker, handed him a very small tusk which was covered by an enamel cap). In many of the specimens Dr. Atkinson said he failed to see the secondary dentine spoken of. They told a different story to him. The original lime-salts had been melted down, but not carried away; they were formed into a magma, and then again consolidated, but not conforming to the original structure. Many of the so-called pus cavities were not abscesses at all, but divisions of the pulp chamber. Wherever there were perfectly smooth walls there had been pulp tissues.

Dr. Friedrichs said that he would not presume to criticise the able demonstration of Prof. Busch, but there was one point that he did not understand, and of which he wished an explanation from Prof. Busch. The spaces seen in the specimens were said to have been produced by abscesses; one was entirely enclosed; in human teeth we sometimes have a deposit of secondary dentine that partially cuts the pulp off; sometimes when globules are devel-

oped, or imperfect formations, we have a cornua recurring high up, the pulp located where we had not expected it. To his mind pus was always associated with an abscess, and the inference he drew was that there must have been a mass of encysted pus. Nomenclature had so much to do with these questions that he would like Prof. Busch's definition of what he meant when he said abscess.

Prof. Busch replied that he had not pretended positively to account for all the abnormal conditions; he had only made suggestions as to the probable interpretations. Some of the cavities might be pulp chambers, and others might be abscess cavities. Where there is irritation and inflammation there may be formation of pus, and then a formation of secondary dentine making a separating wall. His reason for believing that many of the cavities were abscesses was because in cutting them open he encountered the unpleasant, putrid, penetrating odor so well known and promptly recognized.

Dr. Friedrichs said the conditions of growth were so different that the functions of the pulp of the tooth of an elephant were very different from the human tooth. If pus forms in the human, the pulp is destroyed; he could not conceive how it could then continue to perform its functions in the formation of secondary dentine.

Dr. W. C. Barrett said that the tooth of the elephant had a persistent germ, continuing its function through life, analogous to the growth of endogenous plants. In the first place, there could be no pus without infection. At the point of infection microbes had access to it, without which there could be no pus. When the tooth of the elephant was in quite an early stage of development, a wound in the bone near the base of the pulp might give ingress to microbes, bringing about pus infection; in the continuous growth of the tooth, subsequent layers of dentine might coalesce, forming a solid tusk in its elongation, the cavity and its encysted pus being carried forward with its growth until entirely covered in the pus cavity, being thus found at last in the solid portion of the tusk. In others a bridge of dentine may have been formed across, leaving the cavity open. New dentine-forming cells may be organized for the formation of the bridge across the cavity, or the cavity may be obliterated when there is no longer any pouring out of indifferent corpuscles, melting down under the influence of microbes.

Dr. Baldwin, of Chicago, said that it had been asserted positively that micro-organisms were necessary to the formation of pus, and no one had protested. Though it is true that there are micro-organisms everywhere, in the air, etc., yet he took direct issue with the statement that they must be present in the formation of pus. In a felon, pus is formed beneath the periosteum. If the microbes get there through the medium of the circulation (the only way possible), then where is the use of germioides?

Dr. Barrett said he did not think it necessary to argue that point in the present state of biological science.

Dr. A. H. Thompson, of Topeka, Kan., wished to suggest that precedence be given to foreign papers.

Dr. J. Hale Moore, of Richmond, Va., said that much valuable time had been lost in talk that was not scientific, in wrangling as to priority of invention, etc. He thought the section should be guided strictly by the medical code of ethics. He wished to offer a resolution that all papers giving modes of operating, or cuts, diagrams or models of patents, and also their discussion, should be excluded. President Taft said that the editor of the transactions would decide those points.

Dr. Dudley (Salem, Mass.) said there was nothing in the ethics of the medical profession preventing a surgeon from patenting his appliances. He moved that the resolution be laid on the table.

A division being called for, the motion to table was lost and the resolution passed.

Adjourned.

AMERICAN DENTAL SOCIETY OF EUROPE.

FIFTEENTH ANNUAL MEETING AT COBLENZ, GERMANY;
SEPTEMBER, 1887.

REPORTED FOR THE INDEPENDENT PRACTITIONER BY DR. E. A. CALBREATH,
HANNOVER.

CONTINUED FROM PAGE 28.

THURSDAY AFTERNOON SESSION CONTINUED.

Dr. Elliot—I desire to mention one valuable medicine which is not generally known, ethylate of sodium, a thick, syrupy liquid, which destroys hypertrophied gum without pain. It seems impossible to use

it in excess, and it has never done any harm by going between the teeth. It was introduced by a Dr. Richardson, who is not a dentist.

President George—Will Dr. Förberg kindly explain how he grinds porcelain cavity blocks?

Dr. Förberg—I first shape the cavity, press a piece of paper capable of taking a sharp impression upon it, cut to the form indicated, stick it upon the selected porcelain tooth, and grind away all but the part covered by the paper. In this way the grinding can be done in a little time.

President George—Can some one report whether or not the Herbst process has been gaining ground?

Dr. Miller—It has not made much progress in Germany lately. At the last meeting of the German dentists it was not even mentioned. A year ago I sent letters of inquiry to a large number of German dentists, and they all answered that they had been obliged to make the fillings over. I have also heard from three or four parties who were enthusiastic over it, but who have now dropped it. I am certain that not one-tenth use it now of those who did two years ago.

Dr. Rosenthal—Had made extensive experiments, and had found that it was agreeable to the patients, but gave in general bad results.

Dr. Patton—Two years ago, at the meeting of the German Dentists of the Rhine and Westphalia, Dr. Herbst filled two proximal cavities, between two bicuspid, using a separating file as a matrix. He used the rotary method some, but hand pressure more. It took as long to make the fillings as it would have done by the hand alone. I examined the fillings with an excavator, and found the edges soft at several points, particularly at the neck. Dr. Herbst said that doing the work at a clinic, in a hurry and with strange surroundings, it was not so well done as at home.

Dr. Förberg—I had no intention to take the floor, yet I feel compelled to do so, in consequence of the severe criticism that Dr. Herbst, his method and appliances have been subjected to. I always thought it a fallacy to consider the rotary method wonderfully easy. Every one of you gentlemen had been working hard for years before he attained his present skill and perfectness of result. But now, any one who has seen some fillings made by rotation, or at the most made some few trials therewith, believes himself to be a master of the method. If he does not succeed, it is never he, but the

method, that bears the blame. I believe it wants exactly the same accuracy and just as much skill as does any other method, if you wish to produce perfect results. I first use the gold unannealed (introducing and condensing it nearly as you used to do with soft gold), and finish with annealed foil. Dr. Herbst often uses heavy rolled gold, up to No. 200 or 300, for the surface. You can build up the contour only by the use of rotatory stone instruments, without matrix or hand pressure. So far as I can judge, the Herbst method unites the advantages of the methods for soft and for cohesive gold filling; it gives a most perfect adaptation, and the stone bur does not annoy the patient as much as the mallet. Yet it would be unwise to expect dentists who, for perhaps half their lifetime, had been using instruments and methods by the means of which they were able to perform the most excellent operations, now to throw overboard all that, in order to try something new instead. The objections urged against Herbst's ring-matrix are just as valid against all kinds of matrices. I find this matrix easy to adapt, and more practical in every respect than any other. For tin and gold fillings it can be so arranged as to leave just sufficient surplus material to condense afterwards, saving a good deal of unnecessary filing. The wedge-matrix was intended only for amalgam. The specimens on the table are, so to say, developments of the ring-matrix. Some of them were not new to American operators. The great thing, however, in Herbst's inventions (because with him they *were* original inventions), was the simple way in which he gained his results. Thus he made it possible for the great public to have the benefit of remedies and operations which before were obtainable only by the rich people.

Dr. Miller—I often find the teeth too close to enable me to use a matrix. I saw Dr. Herbst put one on in a clinic, and the patient wept. After seeing that, I have never had the courage to use one myself.

Dr. Förberg—Dr. Herbst has made a number of fillings for me. They are good, and I am satisfied. I have seen many of his patients, and they have been well treated.

Dr. Jenkins—A few years ago, Manfred was put on the stage of the Hoftheater in Dresden, as magnificently as it was possible to do it; and when it was all over the conclusion was that a country which had Faust had no use for Manfred. And so I would say

that the man who knows how to use soft gold has no use for the Herbst method.

Dr. Field—That is quite true.

Dr. Tierney read a paper before the society, giving the history of an interesting case. A young lady of about eighteen presented herself with the ordinary symptom of alveolar abscess in the left superior first molar region, which appeared finally to involve the antrum. He extracted the molar and second bicuspid. The usual treatment and frequent cleansing seemed at first to cause an improvement, but after a week's time there appeared to have been no great advancement. He again examined the antrum with a probe, and found in it a hard substance which he removed, and now presented to the society for inspection. It was a temporary molar tooth, much absorbed and somewhat decayed. The question was, how did it get there, and what brought it into that condition?

Dr. Miller—This tooth evidently was not in process of development, but fully grown. It has the appearance of a tooth in process of absorption, and therefore at these points it must have been in connection with living tissue. It also shows evidence of caries, which could not take place unless it were at least partially erupted.

Dr. Tierney—Could not the sharp edges have been produced by the dissolving of the tooth in pus?

Dr. Miller—No.

Dr. Kingsley—I have seen a case somewhat like this. Perhaps the sixth and twelfth year molars, under abnormal conditions, might push a retarded temporary molar up into the jaw, and if so, why not into the antrum?

Dr. Miller—I should hardly think it possible.

President George—We should like to hear something of *Dr. Elliot's* hand-piece for the engine.

Dr. Elliot—This hand-piece differs from all others in many particulars. First, you will see that the cable is enclosed in the French sheath, made of fine woven wire. The bur is held by a lock, and centered by a chuck. It is taken apart, as you see, in almost no time at all. By a spring movement it is released from the cable in a twinkling, thus allowing, as I am showing you, the right angle to be attached directly to the cable. The advantages of this will be apparent to all. I have also two pluggers which I attach directly to the cable. The blow is given by a rotating cam. Such an

instrument must be run more rapidly than the usual machine admits of. One must have a power which will give three thousand revolutions per minute. I have here, also, some raw-hide polishing points, which I have found better than leather, some gutta percha points for filling roots, and some odorless oil.

Two years ago I put in a small gas engine for running the machines in my office and laboratory. Its maximum is about one horse power. Its minimum, about one cat power. It runs in the laboratory three lathes and a machine for drawing wire, and in the operating room, the usual machines. For the boring machine I have it arranged to give me three speeds: about seven hundred, fifteen hundred and three thousand revolutions per minute. The high speed is better for the dentist, but more disagreeable to the patient, so that I generally use a speed of eight hundred. It has cost me in consumption of gas two and one-half cents a day, and runs from eight to ten hours per day.

Dr. Abbott translated a letter from Dr. Hesse of the University of Leipzig.

Dr. Hesse held that it was not necessary for a German to go to America to acquire a dental education now. Formerly the professor made operations before the students, they looking on. That comprised their education. But three years ago Dr. Hesse himself took the first step in advance, and introduced the American system of clinical work. A year later it was introduced in the University of Berlin. He believes the attendance upon American colleges by German students is unwise, first, on account of the barrier of a foreign tongue preventing their proper understanding of the lecture, and second, because they lose valuable time. The only advantage that Dr. Hesse can see in a trip to America by the young German dentist, is that of seeing the many fine operators who are to be found in every American city.

(TO BE CONTINUED.)

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

A regular monthly meeting was held at Newark, Monday evening, December 19th, President Watkins in the chair.

Dr. G. W. Weld, of New York, read a paper on the extraction

of the sixth year molars, illustrated by drawings and models. (See page 75.)

Dr. W. D. Tenison—Mr. President, Dr. Weld's paper is, so far as it goes, very scientific, and probably logical, but I must take exceptions to some of its statements regarding extraction of the sixth year molars. I do not believe it wise to attempt to formulate any universal rule. In a practice of over twenty-five years I have had opportunities for seeing a great deal of the results of extraction, and while many of them are deplorable, in other cases much of benefit has been derived. When I advise the extraction of any of the sixth year molars I advise the extraction of all four of them, no matter whether they are decayed or not, provided both jaws are normal.

The older practitioners know very well that there have been monuments of skill built up in the mouths of their patients in the restoration of sixth year molars, after extensive decay of those teeth, and that in after years they have broken away and been lost. In cases like the one of which a model has been presented, with a perfect articulation of the teeth, I think it would be a crime to extract, but, unfortunately, we do not always find that condition. Where the sixth year molars indicate a tendency to extensive decay and the remaining teeth are in a reasonably perfect condition, I believe it would be proper to extract them. I do not approve of extraction at eight or nine years of age. They should be removed when the second molars are beginning to make their appearance. I will say further, that the gentlemen who object to extraction of the sixth year molars usually produce models of the worst cases. That is not fair. If you look at this mouth I think you will admit that it would be difficult to find one more perfect. (Model shown.) The young man whose mouth this represents is now eighteen years of age. The sixth year molars were extracted at the age of twelve. Unfortunately I have not models of the mouth as it appeared before the extraction of the teeth.

Here are two models of the upper jaw of a little girl for whom I extracted the sixth year molars. The lower models were lost a year ago. These two superior models show the condition immediately after the extraction of the teeth, and nine months subsequently. There is no tipping of the teeth in these cases. I do not pretend to say that that never occurs; but the question arises,

whether the condition we would find in after years, if those teeth were left in the mouth, would not be a great deal worse than that which follows their extraction? You cannot safely follow any iron-clad rule in this matter. I have among my patients families of children now grown up, in whose mouths the results of the extraction and non-extraction of these teeth are shown in strong contrast. When the elder children came into my hands I had not the experience in this matter that I acquired in after years, and I neglected to extract the sixth year molars, as I did in the cases of the younger children; and in the cases where the sixth year molars were extracted there are now good sets of teeth, while the others are constantly under my care. I have always regretted that I did not extract in the earlier cases as well as in the later.

Dr. Weld has ingeniously introduced the diagram of a mechanical arch to prove that it is a mistake to extract teeth, but we do not find such an arch as that in the mouth, and the pressure is not the same when we bite.

Dr. Weld—The principle is the same.

Dr. Tenison—That is a principle of mechanics in connection with building a house, but it hardly applies to dentistry.

Dr. Osmon—Mr. President, I am glad that Dr. Weld has given us this paper, but after all is said and written on both sides of this question, the real kernel of wheat that is sifted out is that this matter must be left to educated judgment and experience. I have seen cases so plain that there was no second thought about the propriety of extracting the sixth year molars; it did not require any consideration to determine that as the proper thing to do; and I have seen other cases just the reverse. Taking the children of the day, generally, as they come to us in this nervous generation, you will find that the sixth year molars are usually in a decayed, decalcified condition. My experience has been that when those teeth are filled, devitalization usually occurs very soon after, and when you resort to devitalization in order to insert filling, the teeth may remain from three to five years, and then they begin to go the way of all flesh. When children come to us after the age of nine or ten years, with the twelfth year molars in place, thoroughly erupted and solidified, if we remove the sixth year molars tipping of the other teeth will result. But if extraction be done prior to the eruption of the second molars, or just as they are coming through the

gum, in nine cases out of ten excellent results will follow. I have a number of such cases where the articulation is as perfect as it would be with thirty-two teeth in the mouth.

Another point should be borne in mind in this connection, which is the fact that the third molar is scarcely ever a very solid or well organized tooth, but is usually soft, decalcified and very susceptible to decay. In many cases they are decayed almost as soon as they put in an appearance in the mouth. Now, if the operator has been premature in extracting the first molars, and the third molars are in a bad condition, the second molars being good, he has only one molar tooth left to rely on for mastication, for in such cases I have found it almost impossible to save the third molars.

Dr. Baldwin—I admit that the sixth year molar is a very weak tooth, and many dentists think that because it is weak it should be removed. I am very much inclined to fall back on the old theory that if it were not best that it should be there it would not have been put there, and there must be some good reason for its removal. Parents do not know how to distinguish between the sixth year molar and a deciduous tooth, and many physicians are equally ignorant. Oftentimes they tell a patient to have a sixth year molar extracted, when, if they really knew it was a permanent tooth, and one that would be useful, they would hesitate, and the tooth might be saved. I think that we can preserve and retain the sixth year molars in a large majority of cases, so many that the exceptions but prove the rule.

Dr. Weld—I do not wish to be understood as holding that there are no exceptions to the principle involved in the illustrations I have presented this evening. My friend, Dr. Tenison, has brought an exceptional case here to support his side of the argument, one in which there has been a complete translation, and no rotation, and it is one case in ten thousand. It is phenomenal that in six years, perhaps less, there was a complete translation with hardly any rotation whatever. The cases which have come under my own observation, and that of others who are older than I am in practice, are those in which the second molars have tipped forward, and there is rotation, accompanied with complete or incomplete translation, resulting in disarticulation and loss of masticating power.

Dr. Tenison—Probably the doctor would admit, if I can show several cases of that kind in the next six months or so, that that is

not one case in thousands. I am sorry that Dr. Weld has not seen a case of this kind before. I have seen a number of them. But I do not bring this forward to prove that the sixth year molars should always be extracted. I do not advocate that, but that our judgment should be used as the cases come up.

I do not condemn the retention of the sixth year molars; I simply say that those who advocate it produce the cases of extraction that show the worst results. They may say I show the best. I believe we should show both sides to the younger members of the profession, and teach them to use their judgment in each individual case, as to whether the sixth year molars should be extracted.

I have extracted the second bicuspid. My daughter had a most magnificently articulated set of teeth. I had refrained from extracting, as I thought it bad practice in such cases, and at the age of sixteen every one of her teeth showed traces of decay in the approximal surfaces. I did not file them apart, but extracted the second bicuspid, and by the aid of plates opened the teeth. Naturally, her teeth were very frail. Now, at the age of twenty-one, she has a very fair set of teeth. I believe she would have lost most of them if I had not done as I did. I would have given thousands of dollars rather than have been obliged to extract those teeth. I never, in my life, saw a better articulated set than they were at that time. But it was a question of saving or losing all her teeth, and the extraction of the bicuspid at that age did not leave as much space as the extraction of the sixth year molars would have done.

Dr. Palmer—Mr. President, there is only one point to which I desire to refer in connection with the paper that has been read. Judging from Dr. Tenison's last remarks, it is not in his opinion entirely a question of the exercise of one's judgment regarding the extraction of the first permanent molars, but as to whether some teeth should be removed that may relieve the crowded condition; and he extracts a molar or a bicuspid, whichever will best serve the purpose. Another point has been, I think, lost sight of in the discussion, and it is, that if any of the first permanent molars are extracted, all should be taken.

Dr. Evans—I do not think it is always judicious to extract the four sixth year molars. Very often we have a large arch in the lower jaw, while in the upper jaw the teeth are much crowded. In

such a case it is not necessary to extract from the lower jaw, where the second molars are present. We relieve the pressure of the teeth by extracting in one jaw, and in a measure overcome the difficulty.

Dr. Tenison—I did not intend to make the extraction of the four first molars a universal rule. I think it is a matter of judgment, and I agree with him that in some cases it is proper to extract only in the upper or the lower jaw, according to the condition found. The development of one jaw may be more perfect than the other. When I advised the removal of the four molars if any were extracted, I was taking it for granted that the two jaws were developed about equally.

Upon motion, the subject was passed.

NEW YORK ODONTOLOGICAL SOCIETY.

REPORTED FOR THE INDEPENDENT PRACTITIONER.

The January meeting of this society was held in the parlors of the New York Academy of Medicine, Tuesday evening, 10th ult., Dr. J. Morgan Howe, presiding.

Dr. R. R. Andrews, of Cambridge, Mass., read a paper on the "Development of Teeth, with Demonstrations of Dentine from the Odontoblasts and Fibril Cells." After elaborating his views concerning the formation of dentine, the doctor related his method of preparing specimens for microscopical slides. Those taken from the embryo are best for sections. He finds little or no satisfaction in the study or examination of specimens obtained by the ordinary methods of preparation, as he considers them imperfect. He thinks he has discovered two distinct varieties of cells that enter into the formation of dentine, one having a higher function than the other. These are the odontoblasts and the fibril cells. The former contribute the matrix and the latter complete the tissue. Dr. Andrews quoted from many noted histologists, presenting their theories of

tooth and bone formation, and then gave the results of his own study and investigations. After reading his paper, he exhibited about fifty photo-micrographs which were beautifully projected upon a screen to illustrate the points under consideration.

Dr. Geo. S. Allen, referred, in a complimentary manner, to the photo-micrographs of Dr. Andrews, and reminded his hearers of the great, painstaking, persistent labor, and careful study required to produce such fine microscopical specimens. He, however, could not accept the theory that there are a double set of cells in tooth or bone formation. He thinks that the odontoblasts form both the matrix and fibrils.

Dr. Andrews—Thinks that he has fully demonstrated that there are two distinct sets of cells, each performing a different function, and he imagines that other histologists will, in time, arrive at the same conclusion.

Prof. Carl Heitzmann—Asserted that all dental fibrils arise from odontoblasts. He read from the *INDEPENDENT PRACTITIONER* extracts from a series of articles contributed by Drs. Heitzmann and Bodecker, and referred to illustrations accompanying said articles. These articles, he stated, were the result of eight years' careful study and investigation, and whoever had taken the trouble to read them ought to have acquired a fair idea of the formation of tooth structures. Prof. H. illustrated on the blackboard representations of cell and tooth formation, and declared that there were not two distinct sets of cells required to produce dentine or enamel.

Dr. Allen—Took exception to a statement of Prof. Heitzmann regarding enamel formation. He does not believe that a perfect cell, once formed, ever breaks up and transforms itself into any other tissue.

Dr. Atkinson—Quoted from John Hunter, that "inflammation is a return of tissues to their embryonic condition." We do not clearly understand the metamorphosis under which enamel is formed. Histologists are constantly laboring to correct each other's mistakes. We should learn all we can on this subject from the best of teachers, but be ready to admit that we do not yet know all.

On motion of Dr. Francis, a vote of thanks was tendered to Dr. Andrews by the society for his excellent paper and beautiful illustrations.

Editorial.

MATRICES.

In the *Dental Cosmos* for April, 1871, Dr. Louis Jack, of Philadelphia, gave a description and illustrative cuts of what was to us a new appliance to be used in the filling of teeth. It was called a dental matrix. Statistics, hastily compiled from the remarks made at dental society meetings, have since compelled the belief that about 4,000 dentists had preceded Dr. Jack in the use of that device, and had "been using it for years." It was eminently one of those inventions which the 4,000, more or less, "had not thought it worth while to mention to any one," but which, when it was mentioned, wrought a revolution in the practice of many dentists. It has proved of sufficient importance to employ the inventive talent of some of the best men in dentistry, in an effort to improve it and to extend its capabilities. We commenced its use very soon after its introduction, and have continued to employ it to this day.

Practically, the matrix may be defined as a temporary wall added to a compound cavity, thus reducing it to a simple one. Its use appears exceedingly easy, but in actual practice it will be found that it will absorb all the skill and dexterity possessed by our best operators. Dr. G. C. Daboll, formerly of Buffalo, now of Paris, France, than whom America has produced few more accomplished operators, and who commenced with it more than fifteen years ago, was accustomed to say that while to use it was the most elementary of processes, to use it well, and to obtain from it all the advantages which it was capable of conferring, taxed his ingenuity as much as that of any appliance in his operating case. This fact undoubtedly accounts for the failure of many skillful dentists who have attempted to employ it. They could succeed in inserting a filling by its aid, but they felt that the work was not equal to that which they could do without it. Could we personally have foreseen from the start the number of failures which, in our own practice, would have been the result of its use, it is doubtful if we should ever have taken it up. And yet, to-day, it is an essential, and there is a class of cavities which we should hardly know how satisfactorily to fill without it.

We have heard objections urged against the matrix which clearly proved that the objectors knew not its limitations, or the cases in which it was especially useful, for it is not every approximal filling which demands its employment. The beginner, indeed, will do well to restrict it to a very limited number of cases, advancing to those more difficult as he gains in experience. It is a mistake to attempt to apply the matrix in perplexing operations until experience has been gained, for ultimate failure will be the sure result. One of the greatest obstacles to success in its employment is the great difficulty in adapting it to teeth having irregular forms and surfaces, and to those from which a part of the wall against which it should impinge is broken away. In adjusting it the rubber-dam must of course be first applied, and then if an unyielding matrix is used, it must be wedged so that it will be absolutely immovable. To secure this we use only thin matrices, and wedge them fast by slips of orange wood dipped in a sandarach solution, wedging from both the lingual and labial surfaces.

The preparation of the cavity for which a matrix is to be used requires great judgment. It is absolutely essential that every part of the cavity should be exposed to the direct action of the plunger. If there be deep undercuts, especially under the wall next the operator, the gold will not be solidly condensed beneath, and failure of the operation will be certain. The cavity must be opened upon the grinding surface to its full size, and if it be large the anchorage should be mainly by dovetails in the crown. When, for any reason, it would be bad practice to cut away the grinding surface of a tooth to this extent, the matrix should not be employed.

It is exceedingly difficult in many cases to secure the lateral marginal walls where the matrix is used. With the old inflexible steel matrix, this was sometimes impossible. If the matrix was firmly wedged against the tooth the gold could not be carried over the frangible wall, and thus be made to act as a support, and for these cases the inflexible matrix was not adapted. We have heard it urged against the matrix that contour could not be secured, but that the filling would be left flat. If this was found to be the case, the fault certainly was with the operator and not with the implement, for, given a tooth with firm lateral walls, the most beautiful and natural shapes and forms can be secured with little difficulty and no waste of material, while the solidity of the whole filling, its close

adaptation to the cervical wall and the density of its masticating surface, may be made such as can scarcely be attained by any other means.

Within a very few years new forms of matrices have been devised, that are for many cases great improvements over the original patterns. Bands, with various devices for drawing them closely about the tooth, seem to be the favorites. The Lardmore-Brunton clamp-matrix is one of the best of these. It is an English device, and may be obtained of C. Ash & Sons, 30 East 14th Street, New York. Guilford's band matrix presents some advantages. It is made by the S. S. White Dental Manufacturing Company. Each of these consists of a band which is placed about the tooth, the ends being drawn together by a screw clamp. Dr. Herbst makes a matrix for each case by drawing about the tooth a German silver band, pinching it together by nippers devised for the purpose, and then soldering it. But of all the band matrices with which we have had any experience, that of Dr. T. W. Brophy, of Chicago, is the best. It is simply a flexible belt to be placed about the tooth, one side of which is made of sufficient thickness to afford a thread for a screw which is driven against the tooth, thus drawing the matrix tight and causing it to conform to almost any irregular contour. It is made in six sizes, so that any tooth can be embraced by it.

Some of the advantages of Brophy's matrix are, its perfect ease of adaptation and the exactness of its fit at all essential points when it is perfectly adjusted. If a portion of one of the lateral walls is gone, the Brophy matrix makes its restoration easy and simple. If it be the lingual wall that is broken down, the matrix should be adjusted with the screw upon the labial side; while, if the labial surface be missing, the matrix should be reversed and the screw be adjusted to the lingual wall. To turn the screw in such cases a key with a flexible joint, like that of the Lardmore-Brunton clamp, is essential. Contour is easily secured, missing walls restored and the gold built over frail walls, if the matrix be perfectly adjusted. In cases of restoration, we are accustomed, when we approach the "knuckle," to slightly loosen the screw and thus give more space. But so flexible is the band that if the gold be driven against one portion a little more forcibly than against the rest, the contour is easily and readily swelled.

But let no one who is without long experience take up the mallet and expect to obtain perfect results at the first effort. It requires great familiarity with its method of manipulation, and its perfect adaptation is no more easily acquired than is that of the rubber-dam, the Perry separator, or the manipulation of the electric mallet.

RATHER CRUDE.

The Western Dental Journal, for November, contains an article on "The Green Stain Upon the Teeth," which is a little remarkable from a number of points of view. It opens thus:

"The green fungus stain, from an etiological standpoint, presents certain peculiarities.

"FIRST—There are fungus stains which are not colored green.

"SECOND—There are bacilli bacteria *ad id genus OMNI* ? (*sic*) to be obtained ad libitum from the mouth."

Are these the "certain peculiarities" that belong to the green fungus? The statement might be paraphrased thus:

Man presents certain peculiarities.

FIRST—There are animals which are not men.

SECOND—There are a great many animals in Brazil.

One who is writing upon strictly scientific subjects should be careful of his logic as well as his facts.

The author speaks of a green cell that is sometimes globular and at other times more nearly oval, the green color of which "appears to spread into the surrounding plants," and from these peculiarities, which are common to a great number of cocci, he seems to identify it with *Micrococcus Chlorinus*. It requires a much more elaborate study than this to distinguish almost anything.

The author also speaks of a "*vibrio lactic*" which produces *acetic* acid. We would not willingly discourage research in any one, but until an observer has made some progress in bacteriology he should be a little modest in presenting his inchoate deductions to professional men, and a little editorial supervision should be exercised lest other beginners in scientific study be misled. The same number of *The Western Dental Journal* says editorially: "The school-boy essayists are catching fits, and right they should!" which, if we ignore its grammatical construction, is certainly a wise remark, and one which justifies us in this criticism.

THE INDEPENDENT PRACTITIONER.

Our many friends will be glad to know that this edition of the INDEPENDENT PRACTITIONER is very much the largest that it has ever issued. From the beginning there has been a steady and healthy growth in its circulation, and at the commencement of each half year since its present publishers have had its management, it has been found necessary to enlarge the edition. Until the present time, it has never made any special effort to increase its subscription list. It has offered no premiums or other special inducements to obtain subscribers, preferring to have its increase depend solely on its merits. The present offer of Prof. Stowell's great portfolio was prompted, not so much for the purpose of helping this Journal as by the desire to fulfill all that is incumbent upon true professional journalism, to spread information by every attainable means, and to familiarize every dentist with the histological structure of the organs upon which he works.

If the publishers of this Journal have an honest and earnest ambition, it is to be of some real service in their profession, and to this end they have devoted money and labor freely, without the hope or expectation of pecuniary reward. They are proud to say that their efforts have met with a recognition both ready and hearty. We know that the great majority of dentists, in this and other countries, will rejoice at the success and continued prosperity of this Journal, and we earnestly hope that all of our worthy contemporaries may enjoy equal success. The INDEPENDENT PRACTITIONER has never permitted itself to indulge any feeling of jealousy towards its compeers, but hails them all as co-workers with it in the great cause of dental progress.

"MR. BULLIN'S TRIBUTE TO AMERICA."

All the American Journals are cock-a-hoop over the "tribute" paid in the now well-talked of Chester address; one would imagine such jubilation followed upon restitution of some long contested and oft refused right, instead of a mere passing notice of our indebtedness to our cousins, a debt which has been cheerfully conceded, but not quite in the expansive manner sometimes indulged in by after-dinner speakers.—*British Journal of Dental Science*.

Will the B. J. D. S. kindly indicate *what* American Journals are "cock-a-hoop" over Mr. Bullin's address, or, indeed, what journals have particularly referred to it in any manner?

The address at Chester and the discussion to which it gave rise are matters which concern English dentists alone, and American journals are not apt impertinently to interfere in family quarrels. Especially do we believe American dental journals quite incapable of an attempt to make party or controversial capital out of an unfortunate difference of opinion among our English brethren, or to misrepresent facts in order to score an unfair point against an adversary.

HORSFORD'S ACID PHOSPHATE.

Nearly two years ago the editor of this Journal began to fear that a physical organization of which he was justly proud had been irretrievably injured by overtaxing its capacities, and by failure to observe proper periods of rest. He was a victim of indigestion, nervous depression and the horrors of insomnia. He was informed by competent medical authority that an entire vacation of some months would be necessary, but this seemed impracticable in view of the duties which devolved upon him. He was then recommended to commence the use of Horsford's Acid Phosphate, and to buy a horse, as the next best things. The former, that he might be certain of its quality, was obtained from the Rumford Chemical Works in Providence, R. I., and the latter was found nearer home. He has literally followed both, and cannot be certain which has given the most profit and pleasure, but knows that each has played an important part. The Acid Phosphate is certainly the cheapest, and, in this case, has proved best worth the money. After taking it for a time the old ambition and love for work returned, and the day's duties were no longer a dreary task. The victim of sleeplessness began to sleep well at night, and, indeed, when he found that ten hours no longer sufficed, began to think it time to discontinue the phosphate, or to give the day as well as the night up to slumber.

There are few vocations that make greater demands upon the nervous system than that of the operative dentist, and we believe that indigestion and wakefulness are more common among them than in almost any class of people. Very many such would find a great relief in the use of the Acid Phosphate. With sugar and water it makes a very pleasant drink, and for derangements of the secretory and nervous systems, it is especially useful. From personal use and knowledge we most heartily commend it to dentists who are sufferers from over-work and worry.

BIBLIOGRAPHICAL.

THE EVOLUTION OF IMMORTALITY; or Suggestion of an Individual Immortality based upon Our Organic and Life History. By C. T. STOCKWELL. Chicago: Charles H. Kerr & Co. 1887. Price, \$1.00.

This is a fascinating little volume, and places our good friend, Dr. Stockwell, in a new light. He is earnest and honest in whatever he says and does, his premises are always clearly stated, and in this volume he proves that he is a metaphysician of no mean acquirements. A perusal of this work will astonish those who have known only his professional and scientific life, for they will view him from another and favorable standpoint. Yet his many friends will recognize the same mental characteristics that are exhibited in his professional writings, for he impresses his own genial personality upon all the products of his pen. For this reason it is a difficult task for a personal friend and admirer impartially to review the book. It is so hard to dissociate it from its author and to prevent personal regard from improperly biasing the mind in estimating the book.

While we read with continued pleasure it was not always with approval of the reasoning. The book is a singular compound of the dead past with the living present—of the theories which were the outcome of the ages of darkness, and the scientific verities of to-day—of the conception of creation and life as taught us by those who claimed to have a direct revelation from above, but which was always the reflection of the views and beliefs of those through whom the revelation was given, and of the unerring truth as written in the imperishable works of creation by the very finger of the Creator himself. And yet so ingeniously are they woven together into the fabric of the book that it is hard to say just where a protest could begin. Like most metaphysicians, Dr. Stockwell begins where he should leave off—that is, with a theory. There is sometimes perceptible a curious confounding of scientific facts, and a singular translation of technical terms. For instance, force is sometimes alluded to as a mode of motion, and again as an entity. Inheritance surely is not a force; it is simply inertia—resistance to active differentiation. Adaptation to environment is but the friction on which force is too often wasted. Of *spiritual* force we can have no real conception, and hence it exists for us but as a name. When

it shall have been dynamically demonstrated we may take its influence into account, but scientists have no right to employ unknown and undemonstrable qualities. The same influence that brings about the rupture of the Graafian vesicle bursts the germinal point in the kernel of corn, and hence, if there be a body and a spirit in the one, there should be in the other.

But while the book may be open to criticism from a scientific point of view, metaphysically it is charming, through its internal evidence of profound thought and its fertile suggestiveness. There is so much of ingenuity displayed in the argument, and old facts are presented in such new lights, there is such a *vraisemblance* of demonstrated things in its speculative reasonings, there are so many mere idols which are fully personified, that all of Dr. Stockwell's friends should desire to purchase and read the book, if it be only as a souvenir of the man; and if all his friends do order it, a new edition will be called for within a week. It may be obtained by sending one dollar to him at Springfield, Mass.

A MEMORIAL OF MEDICAL JURISPRUDENCE: with Special Reference to Diseases of the Nervous System. By ALLEN McLANE HAMILTON, M. D. Illustrated, 1887. E. B. Treat, 771 Broadway. Price, \$2.75.

This is another of the series of volumes published by Mr. Treat, under the name of "Medical Classics." It is intended as a book of reference for lawyers and doctors. It is not a treatise upon forensic medicine, but rather a hand-book of the conditions and disturbances of the nervous system that are so often the foundation for suits at law, or which are involved in the settlement of the estates of deceased persons. The different chapters treat of insanity and its medico-legal relations; hysterical conditions and feigned diseases; epilepsy; alcoholism; suicide; cranial and spinal injuries. Each of these chapters is subdivided and considers its subject under exceedingly well classified sub-heads, with reports of cases, legal decisions, etc. There is a wealth of information in the book which every medical practitioner might study with profit; not alone of the legal bearings of neural and other disturbances, but of their pathology and clinical aspects as well, for the work was written by a medical man, and not by a lawyer.

NOTE.—The remainder of "Bibliographical" is crowded out of this number.

Current News and Opinion.**DENTAL SQUIBS.**

BY "MEANDER."

* * *

In a recent number of one of our dental journals there were five "original communications" on "Capping Exposed Pulps," "Treatment of Exposed Pulps," and one brother got so far as to adopt quills. He has perception enough to see that it won't do to put any kind of permanent pressure on an exposed, or even on a partially exposed, pulp.

* * *

Every one who practices dentistry would like to succeed. As one element of success, how would kindness work? Kindness so marked as to germinate into sympathy. An honest, cordial reception will establish a more enduring relation, and that is what is wanted to retain patients.

* * *

Gentleness, politeness, unaffected cordiality, cleanliness, and courtesy are five nouns that will grace any dental office in this or any other land.

* * *

Some of our wise brethren advocate the combination of gold foil with tin foil, rolled together, as a good filling material for—let Meander add *soft*—teeth. It is a most excellent marriage, receiving the blessing of all conservative relatives. It forms an excellent commencement for cervico-approximating walls. Bury the tin, though! That is, in such cases, put over the baser metal, two sheets of No. 4 gold foil.

One good brother says he uses No. 4 tin with No. 4 gold. Meander has conceived and brought forth this fact; that No. 2 tin foil will much better permit the hiding of the gold than will No. 4, and at the same time fully perform all the functions of a soft-hard filling.

But where can one get No. 2 tin foil? Meander could find none at the depots, therefore he wrote to Edward Kearsing, of No. 101 Hoyt St., Brooklyn, N. Y., and this Beater beat him out some good, pure, reliable No. 2 tin foil. This same Beater beats out all of Meander's gold foil, and has done so these many years!

ANTISEPTIC MOUTH WASHES.*Editor Independent Practitioner:*

Being convinced that not only decay of the teeth, but many of the complications following upon it, as well as many affections of the mucous membrane of the mouth, of the gums and of the pericementum, are of parasitic origin, you may readily understand that I should attach great value to any substance possessing marked antiseptic action which might be used freely in the human mouth

without danger of injury to the teeth, the mucous membrane or the general health. I hope soon to be able to give you the results of a series of experiments which I have been making with reference to this question. At present I wish only to call attention to a formula which I published some two years ago in a German medical journal, and which I see has found its way into various dental journals. This formula is

Thymol,	0.25
Benzole acid,	3.00
Tincture of Eucalyptus,	15.00
Water,	F. 50.00

This mixture possesses powerful antiseptic properties, but was never designed for use in the mouth. It was only to serve as a base upon which a good mouth wash might be constructed. I will send you, in two or three weeks, a detailed account of the experiments which I have made upon this question, and the results at which I have arrived, and hope you may be able to give them a place in the *INDEPENDENT PRACTITIONER*.

W. D. MILLER.

CORRECTION.

Editor Independent Practitioner:

In the November number of your excellent Journal is found the following sentence: "Dr. Busch is Superintendent of the Dental Department of the Universities throughout Germany." This is a mistake which, if not corrected, may be the source of much inconvenience to me, and I therefore take the liberty to ask for a correction as follows: Dr. Busch is Professor Extraordinary in the Medical Faculty of the University of Berlin, and Director (superintendent) of the Dental Department.

Peter Dr. Busch.

Director of the Dental Institute.

ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO.

The third annual dinner of the faculty and students of the Toronto School of Dentistry was held at the Rossin House, Toronto, Tuesday evening, Dec. 13, 1887. The class, which numbers forty-eight, is an unusually intelligent one, and the dinner was a marked success. Perhaps the most significant speech of the evening was that of the Vice-Chancellor of Toronto University, who announced that for some years the school of dentistry had been carefully watched by the Governors of the University, and so thoroughly were they convinced of the high character of the instruction afforded, and the unquibbling claims to recognition of the school, that it had been determined to accept its offer and to incorporate it as a department of Toronto University.

MARRIED.

Tuesday, December 27, 1887, at Chicago, Dr. LOUIS CUNIFF and Miss NELLIE L. FREEMAN.

The *INDEPENDENT PRACTITIONER* tenders its compliments to the happy couple, and hopes that both may live to celebrate many, many happy anniversaries.

MISSISSIPPI VALLEY DENTAL ASSOCIATION.

CINCINNATI, January 18, 1888.

The forty-fourth annual meeting of the Mississippi Valley Association of Dental Surgeons will be held in Cincinnati on the first Wednesday in March, 1888, (March 7th).

The following is a partial list of papers to be read and subjects for discussion :

"The Dental Pulp." Junius E. Craven, D. D. S.

"Immediate Root Filling." H. A. Smith, D. D. S.

"Implantation," with clinical demonstration. M. H. Fletcher, D. D. S., M. D.

"Combination Fillings." H. J. McKellops, D. D. S.

"Constitutional Aspects of Pyorrhoea Alveolaris." J. H. Callahan, D. D. S.

"Incidents of Office Practice."

"Voluntary Papers," are expected from Dr. W. D. Miller, Berlin, Germany, and Dr. N. W. Williams, Geneva, Switzerland.

Prize essay subject. "The Causes of Deposits on the Teeth and Methods of Removing the Same." (A prize of twenty-five dollars was offered for the best essay on this subject at the last meeting of the society. See minutes for terms of awarding the same.)

Presid't A. W. HARLAN, Chicago

C. M. WRIGHT,

Sec A. G. ROSE,

Ch'm'n Ex. Committee.

Cincinnati.

ST. LOUIS DENTAL SOCIETY.

The St. Louis Dental Society held its annual meeting Tuesday evening, Jan. 3d, and elected the following officers for 1888 :

President—Dr. Henry Fisher.

Vice-President—Dr. J. Warren Wick.

Corresponding Secretary—Dr. Wm. Conrad.

Recording Secretary—Dr. J. H. Spalding.

Treasurer—Dr. A. J. Prosser.

Publication Committee—Drs. A. H. Tuller, Geo. P. Holmes, W. N. Morrison.

Committee on Elections and Ethics—Drs. J. B. Newby, W. H. Eames, G. A. Bowman.

WM. CONRAD, Cor. Sec.

Hotel Beers.

MASSACHUSETTS DENTAL SOCIETY.

The following members were elected officers for the ensuing year at the annual meeting held Dec. 9, 1887 :

President—H. C. Merriam, Salem, Mass.

First Vice President—G. A. Gerry, Lowell, Mass.

Second Vice-President—R. R. Andrews, Cambridge, Mass.

Secretary—G. F. Eames, 62 Trinity Terrace, Boston.

Treasurer—Edward Page, Boston.

Executive Committee—E. B. Hitchcock, A. H. Gilson, W. E. Page, J. K. Knight, E. C. Leach.

G. F. EAMES, Secretary.

THE FIRST DISTRICT DENTAL SOCIETY MEETING

The editor of this Journal was unable, because of illness, to attend the New York meeting of the past month, but learns that it was a success. The elaborate programme was well followed, and the clinics at the New York College of Dentistry were very instructive and well attended. Some of the papers read at the evening meetings were of decided interest, and the discussions were animated and earnest. Wednesday, January 18th, at 4 p. m., the annual dinner was given at Morriello's, about seventy persons being present. The occasion was enlivened by toasts and speeches, and was a very enjoyable affair.

THE SOUTHERN DENTAL JOURNAL publishes the particulars of a truly remarkable case of implantation, as follows:

Case 1. Rev. George Washington Thompson (colored). Age 52. Implanted September 26th, a right superior central. There was no visible inflammation at any time. At the expiration of two weeks the ligatures were removed, and in one month the tooth was formed in an old box which had not been opened for seventeen years. It had turned a few shades darker.

We rise for information and a few additional particulars. Was the Rev. (Rev. W. Thompson the implanter or the implantee? If the latter, was the tooth implanted in his box or in his mouth; or are the two terms, as here used, synonymous? If the latter be the case, are we to understand that the colored man, and he a Reverend too, had not opened his mouth for seventeen years? And about that "visible inflammation." Do Reverends, or colored people, or reverential colored people, have visible inflammations? We have seen visible inflammations, but not the inflammation itself, for that is supposed to be but a psychological condition. Altogether, we fear we are worse mixed over this case than was the author of "Translated from the German" in the same number, when attempting to give information concerning "Zahnhrenstiers."

ALBERT P. BRUBAKER, M. D., December 19, 1887, read before the Philadelphia Neurological Society a paper upon "Dental Irritation as a Factor in the Causation of Epilepsy," in which he says:

"The object of this paper is to direct the attention of physicians to a cause of epilepsy which has not hitherto been estimated at its full value, inasmuch as in none of the standard works upon neurology is the subject ever alluded to, viz., pathological states of the dental structures. That dental inflammation and disorders are more often provocative of epileptic seizures than is commonly supposed, appears quite certain from the following cases, and also from the character of the cause and its effect. Many reasons might be given why dental disorders are peculiarly adapted to call forth this periodical discharge, and why these disorders are habitually overlooked by the physician, but they need not be detailed here."

Then follows the details of sixteen cases in which dental disorders were found associated with epilepsy, the removal of the offending teeth or the picking of the oral cavity in a healthy condition being followed by a cessation of the epileptiform attacks. The paper is published in the *Medical and Surgical Reporter* of January 21st.

THE KANSAS STATE DENTAL ASSOCIATION has given some of the most important and comprehensive mechanical clinics for its members of any society of which we have knowledge. Two years ago Dr H. W. Howe, an accomplished mechanic, demonstrated before it the making of a full banded gold plate, from the refining of the gold to the final finishing. This year Dr. H. W. Parsons, of Wamego, the supervisor of clinics, issues a circular inviting all members to bring casts of any abnormal conditions, with models of the appliances used, and also to present malformations and surgical cases for comparison and instruction, and thus to found an annual museum. Such a thing might be made very interesting and profitable.

WE LEARN FROM THE INDEPENDENT PRACTITIONER that sulphuric acid contains no sulphur. We thought the formula was H_2SO_4 . Oil of turpentine was formerly thought to be Oleum Terebinthinæ, and kerosene has been spoken of as Petroleum. We live to learn. *Dental Review*.

We hope you do not live in vain. A true oil is a salt. It consists of a fatty acid uniting with a glycerine base. Petroleum (*Petra-Oleum*, Rock Oil), is a misnomer. It is a hydro-carbon. It is unsafe to judge of the character of a compound by its popular name. Sulphuric acid is called oil of vitriol; but it is several degrees removed from the fats. The paragraph to which the *Review* refers was a clipping from another journal to which we intended to give credit, but the editor proposes and the compositor disposes.

PLINY THE YOUNGER relates that Marcus Curius, nicknamed *Dentatus*, had all his teeth at birth. Richard III, had the same, and Jacobi reported the case of a Spanish dwarf, who was born with all his teeth, all of which remained; he had a beard at seven years of age, and became a father at ten. A woman named Mary Wood, aged ninety-eight, had nine new molars at that age, and a certain Scotch farmer lost all his teeth at sixty, and six months later he cut a new set without the aid of the dentist, and had them all when he died at ninety-six years of age.—*Medical Press*.

Some of the assertions in this paragraph should, we think, be taken *cum grano salis*.—EDITOR.

MARGARET DUNN brought suit recently against Dr. F. Hasbrouck, of New York, to recover the snug sum of \$5,000 damages for injury done to her jaw. She said that one of Dr. Hasbrouck's assistants extracted several teeth for her over two years ago, and since that time she had been unable to work her jaw, without discomfort. Experts were present and testimony given for both plaintiff and defendant. The jury decided in favor of defendant, so the woman got no pin money. A sensible set of men were the jurors.

DR. GRANT BEY, in the *New York Medical Record*, for November 26th, asserts that we have a more or less continuous history of medicine for nearly six thousand years, which would place the beginning of medicine at about 4,000 B. C., and as this is about the date that bible commentators have agreed in assigning to the creation of the earth, it at once shows that medicine has a very respectable age.—*Maryland Medical Journal*.

A YOUNG MOTHER with her three-and-a-half years old daughter occupied a seat in a railway car, and directly behind them sat two gentlemen engaged in conversation. In the course of their remarks one of the gentlemen said that he had not been feeling well of late, and described his ailments to his companion. At this point, our little "tot," who, unnoticed, had been quietly looking out of the window, climbed upon the seat, turned about and facing the complainant, said: "Wat oo' want is a dood dose of 'cod-liver-oil.'"

"I believe you are right," responded the gentleman, "and I think I will follow your advice," when both indulged in a hearty laugh at this unlooked for and sensible suggestion.

F.

DR. B. C. WINDLE, in a paper read before the British Dental Association on "Man's Lost Incisors," reaches the following conclusions:

1. Man's original dentition included six incisors.
2. The lost incisor is the second lateral.
3. This loss is consequent upon the contraction of the anterior part of the jaw.
4. Suppression of the present lateral incisors is now taking place.
5. Conical teeth are a reversion to the primitive type.

THE EDITOR OF THE DENTAL ADVERTISER, of Buffalo, has a very singular way of exhibiting his appreciation of professional courtesies shown him. He should have learned long ere this that men imbued with a professional spirit do not carry on a scientific discussion or attempt to advance professional knowledge by the use of personalities and scurrility. The *tu quoque* argument is seldom appealed to when any other is at hand.

DR. WARDWELL'S rubber foot pad for the treadle of the dental engine is something more than a mere convenience. We have one in use, and find that the engine really is made to run more easily, for the foot keeps any position on the treadle, and there is no energy wasted by slipping and sliding. It looks neat, and the engine is readily run from any position.

DR. A. W. HARLAN, editor of the *Dental Review*, with his wife, sailed for Europe January 26th for a vacation trip. We hope it may be marked by no untoward event, and that the net results may be health, pleasure and a renewed energy for the duties which will await his return.

VICK'S FLORAL GUIDE is a thing of beauty. That man has won a proud position who can claim to be first in his chosen field, and the pre-eminence of Vick in floriculture is almost universally acknowledged. Send to him at Rochester, N. Y., for flower or garden seeds, or for plants and bulbs, if you wish those that are true to name and sure to germinate.

DRS. ROGEE AND DAVENPORT, of Paris, have removed from No. 66 to No. 73 Boulevard Haussmann, as may be learned by a reference to their card in the advertising pages.

PARKE, DAVIS & CO. send us a fine picture of Sir Morell Mackenzie, the specialist who has won fame through his connection with the case of the Crown Prince of Germany. He seems to have been more fortunate than some of America's physicians who attained only notoriety through their connection with the cases of Presidents Garfield and Grant.

ARCHIVES OF DENTISTRY, in its December number, announces that it will no longer be published by J. H. Chambers & Co., the book and journal publishers of St. Louis. For the future it will be in the hands of the dentists who have so successfully edited and conducted it during the past year. We trust it may meet with continued prosperity.

ANOTHER of Professor N. S. Shaler's notable articles on the Surface of the Earth appears in *Scribner's Magazine* for February under the title of "Volcanoes." Among the illustrations are a number of very picturesque views of the great eruption in the Sandwich Islands, which have never before been engraved.

SUBSCRIBERS WHO MAKE REMITTANCES will find their receipts enclosed in the next number of the Journal. It is not convenient for us to send them by separate mail, as the account is kept with the subscription list. Remember that all subscriptions should be sent to the Buffalo office.

DR WILLIAM STRANGER, in the *British Medical Journal* for November 25th, reports a case of gangrenous abscess of the lung caused by the stump of a tooth, which passed into the right bronchus during an extraction of several roots under chloroform, by a dentist.

THE MEDICAL SOCIETY OF THE STATE OF NEW YORK will hold its eighty-second annual meeting at Albany, on the 7th, 8th, and 9th of February, inst. The published programme shows a long list of papers by some of the most eminent of the physicians of the State.

MR. PENFOLD exhibited before the Odontological society of Great Britain a new antiseptic, called by its discoverer, Salufer. It is a fluosilicate of sodium, and it is claimed that it is non-poisonous, non-irritant, but powerfully disinfectant.

DR. JULIAN W. RUSSELL, of Brooklyn, N. Y., is authorized to receive advertisements for the *INDEPENDENT PRACTITIONER*, and any contracts which he may make will be acknowledged by the publishers.

DR. W. D. MILLER, of Berlin, has removed from No. 2 Hausvoigteiplatz to No. 32 Voss Strasse, where those who desire to communicate with him should address their letters.

LUBRICANT FOR BRASS.—One part of pure india rubber melted, and two parts of vaseline, is said to make an excellent lubricant for brass. It is non-corrosive and lasting.

THE Independent Practitioner.

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NO. 3.

NOTE.—No paper published or to be published in another journal will be accepted for this department. All papers must be in the hands of the Editor before the first day of the month preceding that in which they are expected to appear. Extra copies will be furnished to each contributor of an accepted original article, and reprints, in pamphlet form, may be had at the cost of the paper, press-work and binding, if ordered when the manuscript is forwarded. The Editor and Publishers are not responsible for the opinions expressed by contributors. The journal is issued promptly, on the first day of each month.

Original Communications.

CONTRIBUTIONS TO THE HISTORY OF DEVELOPMENT OF THE TEETH.

BY CARL HEITZMANN, M. D., AND C. F. W. RÖDECKER, D. D. S., M. D. S.

CONTINUED FROM PAGE 65.

M. Pflüger (*Deutsche Vierteljahrsschrift für Zahnheilkunde*, 1857, page 167) gives a complete and concise record of the earliest literature of our subject, and we offer a translation of that portion:

“Eustach, in 1574, made the first discovery of the germs of the incisors and eye-teeth, but did not find those of the back teeth. He also stated that he found the tooth-sacs (*Zahnfächer*) filled with a substance appearing like plaster of Paris, by which the teeth were driven out of their sockets. After this time nothing was done till Leuwenhoek, in 1722, again made some microscopical examinations. In 1728 the development of the teeth was described by Fauchard, who stated that they grew in layers from inward to the periphery, and that the temporary teeth were provided with roots.

.. In 1745 Herissant first noticed the development of the separate tissues of the tooth. He believed that the enamel was formed by glands which were present upon the inner surface of the tooth-sac. In 1771 van Swieten and Brunner asserted that the temporary teeth were rootless, but that if they were left in the mouth too long, they might sprout roots. In 1780 Robert Blake, in his *Diss. Inaug.*, stated that the teeth were covered by cement, or *crusta petrosa*, which was shown by Flourens to be present on the teeth of animals, and later, Alexander Nasmyth discovered the presence of this substance upon human teeth.

“The first to give any of the details of the development of the teeth was Delabarre, in 1815, who stated that previous to the eruption of the teeth he found no openings in the gums which would represent the apertures of the sacs in which the germs of the teeth are situated, and through which they afterward grow. Serres, in 1817, very correctly described the time of the formation of the tooth-germs. Delabarre gave the result of his investigation in 1819, as follows:

1. “The periosteum of the alveolus is a special membrane for the socket.
2. “The membranes of the tooth are, through the periosteum, in connection with very many nerves, arteries and lymphatic fibers.
3. “On every tooth-germ there is present an appendix of different size.
4. “The tooth-sacs communicate with openings upon the gums.

“In 1830 Leszai published a rather creditable work, which, however, was incomplete in regard to the temporary teeth. This author described a horny substance, and mentions the presence of two membranes in a tooth sac.”

Pflüger then, after quoting the more recent writers, enters upon the origin of the epithelial cord. He could easily trace the origin of the spindle epithelium (cylindrical), but was at first unable to account for the presence of the round cells between these two layers, till very patient studies convinced him that they originated from the cylindrical epithelium (*spindelförmigen Zellen*). He describes the development of the epithelial cord into the cup shape, which is filled by the dentinal papilla. He noticed that during the process of development the external epithelium, by lateral expansion, becomes less distinct, which this author thinks might be produced by the pres-

sure occasioned through the metamorphosis of the round cells into star-shaped ones. He also noticed the formation of the tooth-sac, as well as that of the enamel, which latter, he states, is formed by the cells which lie close upon the dentine, but he does not state in what manner. He again calls attention to the stellate reticulum, which, as this author expresses it, looks very much like connective tissue, and which is gradually lost as the development of the enamel advances.

A. Retzius (Arch. f. Anat. Physiol. and Wiss. Med. [Müller's], 1837, pages 486 to 565) discusses thin sections of teeth obtained while yet in their alveoli, by means of saws and files. He preferred fresh specimens, on account of their elasticity during their preparation. He observed that the enamel was composed of six-sided prisms, which exhibited cross lines (*Striae of Retzius*), giving it the appearance of being composed of little blocks. He was not able to give an explanation of their origin, but thought that every little block of enamel was enveloped by organic substance, and thus the striated appearance was produced.

This author describes a membrane thought to be present between the layer of enamel and dentine in fully formed teeth. He states that the enamel prisms have one end resting upon this membrane, while their distal extremity ends upon the periphery of the enamel. Retzius observed the stratification, as well as the pigmentation, of the enamel, and believes the former originates from the different periods of calcification during the formation of the enamel. The pigmentation he believes to arise either from stoppages in the process of the development of the enamel, or a grouping together of the transverse lines (*Striae of Retzius*) in the enamel prisms, or from both causes. He also states that Leuwenhoek (1678) had described these lines in the teeth.

Retzius in his resumé (page 563) compares the structure of the enamel to that of the crystalline lens, and believes that the enamel, like the former, is nourished by the fluids of the blood through the dentinal canals, which then, by means of the thin films (*Mantwände*), such as the author states to be present around each little enamel block, establish a circulation in the enamel. He devotes a great deal of space to a description of the dentinal canaliculi, their size in different localities, their general course and divisions. He believes that the canaliculi have separate walls, and are filled with

an organic earthy material. The cementum he believes to be identical with bone tissue, and states that it ends as a very thin layer on the neck of the tooth. Besides describing human teeth, this author gives a good account of the teeth of twenty-six different animals.

John Goodsir (Edinburgh Medical and Surgical Journal, January, 1839,) gives a clear description of the macroscopical appearances, together with the primitive dental groove of the jaws of foetus, as well as the formation of the papillæ, which he first noticed about the second month of intra-uterine life. These papillæ (as he describes them) gradually become surrounded by a ridge, which grows up from the mucous membrane of the gum until at last it forms a perfect enclosure around the papilla, this at the same time sinking down into the body of the jaw. He also describes the formation of the lateral laminæ which enclose the sacs transversely, and later on mentions the enamel organ, in which he found no vessels. He also observed the follicles of the permanent teeth, which he describes as at first situated above the sacs of the temporary teeth, but afterward sinking to their sides. This author divides the development of the teeth into stages; the follicular, the saccular, and the eruptive, and one preceding these, the papillary stage.

J. Henle (Allgemeine Anatomie, Leipzig, 1841, page 859,) observed the stratification as well as pigmentation of the enamel. The former he believes to arise from the wavy course of the enamel prisms. As regards the origin of pigmentation he agrees with Purkinje, who believes it to arise from the cutting of the section through bundles of wavy enamel prisms, which when cut in this position are thought to refract the light in a peculiar way. He states (page 861) that Serres discovered in the gums of the foetus and new born children some gland-like granules (evidently the nests and buds of the external epithelium, which the writers have depicted in figs. 5 and 6), and which Serres called *Glandulæ Tartari-cæ*, being of opinion that they secrete the calculary deposits, but found these formations to contain thin epithelial plates, and believes them to be ordinary mucous follicles.

Henle states that already Herissant, in 1754, had described small openings upon the gums of embryos which communicated with the tooth sacs, and through which the teeth were shed, and after

quoting Goodsir's publication regarding the formation of the papillæ, he states that the inner surface of the enamel organ (*Zahnsäckchens*) is smooth and lies upon the dentine germ, the surface of which is covered by the *membrana præformativa*. The cells are lengthened and stand in a regular row, but higher up he found round and other varieties of cells, which during the growth of the dentine arrange themselves and become cylindrical cells, and these form the fibers and their branches.

Henle further states that the enamel organ envelops the dentine papillæ like a cup, the inner layer of which is lined by a row of cylindrical or polygonal cells, arising in the same manner as those of the dentinal papillæ (odontoblasts). This author observed a film between the enamel organ and the formed enamel, and on page 868 he says: "At first the uppermost layer of (enamel) fibers are in contiguity with the enamel organ, gradually separating itself from it and becoming an independent film, which may be called the enamel film, or *membrana adamantina*." He observed no vessels in the enamel organ. He further states that the dentine contains open tubes which are filled with a fluid. He believes that the cement may be formed partially by the tooth sac.

Robert Blake (*An Essay on the Structure and Formation of the Teeth of Man and Various Animals*, Baltimore, 1848,) observed about the fourth month the rudiments of vascular membranes of twelve teeth in each jaw, all the temporary as well as the first permanent molars. He found these to be intimately connected with the gums, and thus believed that they were derivations from it. He also noticed the enamel organ in which he observed no blood-vessels. The enamel he calls "*cortex striatus*," and regards it as a substance merely composed of crystals, and formed by a membrane, which, after having performed its peculiar function, is totally wasted or absorbed. He further states that a part of this membrane remains on the body of the tooth, which, however, is destroyed when the tooth has risen to its proper height. Blake is of opinion that the *cortex striatus* (enamel), when the tooth penetrates the gums, is as hard and perfect as it can be at any future period of life, and does not after that period receive the slightest degree of nutrition. He also observed anomalous formation of the enamel, which he attributes to constitutional derangements during its formation. He frequently observed on otherwise healthy human

teeth some parts of the enamel to be quite soft, while in the different classes of the lower animals that he examined he never saw a single instance in which the enamel was imperfect. On page 84 he quotes a statement from Wooffendale, who attributes defects of the enamel to small-pox, and when present on both the temporary and permanent teeth Wooffendale suspects that such a child must have had the small-pox twice.

R. B. Todd and W. Bowman (*Anatomy and Physiology of Man*, Philadelphia, 1850, page 532) regard the teeth on account of their origin from the oral mucosa as tegumentary appendages. They observed that the primitive dental groove was formed about the sixth week, being later transformed into the enamel organ, and that this forms the lining of the follicle and is reflected over the surface of the papilla. They also mention the stellate reticulum (enamel pulp) which originates between the two layers of epithelium, and is separated from the dentinal pulp by only a row of columnar epithelium (the enamel matrix), while, as they state, "on the opposite surface the blood-vessels of the membrane lining the alveolus are seen coming up to, and forming loops immediately under, the enamel pulp, without penetrating it." It is further remarkable that short tubes filled with glandular epithelium descend among these vessels from the enamel pulp, and end with blind extremities. How these tubes (the knobs and buds of the external epithelium as described in figs. 5 and 6), which are evidently glandular, can discharge their contents, it is difficult to understand, seeing that they appear to open into the substance of the enamel pulp. These authors express the possibility that the stellate reticulum between the two rows of epithelia only performs the mechanical duty of protecting the growing enamel from injury, and provide space for development. They also observed that prior to the calcification of the dentine the nucleated particles of the pulp arrange themselves in rows, and multiply by transverse divisions. The origin of the basis substance of the dentine they explain in such a manner that the basis substance and the tubes originate from the cell itself, and the dentinal fibers are formed from their respective nuclei, which elongate and coalesce, the process being, as they state, similar to the formation of bone tissue. The formation of the enamel they believe to be that the enamel cells (ameloblasts) undergo direct calcification, and that other cells are added

when the first have been used up in calcification until the enamel has obtained its proper thickness. They state, "It is from that surface of the enamel pulp which looks toward the tooth that this successive development of new enamel columns proceeds. As they form, this tissue wastes, but it is not probable that the pulp is converted into the columns as the dentinal pulp is converted into dentine, because the anatomical characters of the pulp are so dissimilar from those of the columns."

L. S. Beale (On the Structure and Growth of the Tissues and on Life, London, 1865, page 148), in the formation of dentine, observed between the formed dentine and the vascular pulp a layer which looked like nucleated columnar epithelium, and further says: "Although the pulp diminishes in size while the formation of the dentine proceeds, the pulp does not become the dentine. * * * This dentine results from changes occurring in a tissue which lies upon the surface of the pulp. This consists of cell-like columnar tissue. * * * As new dentine is formed, these cells encroach upon the pulp, the constituent tissues of which gradually diminish in amount." The author agrees with J. Tomes that the dentinal canals are not empty, but contain living fibrils, which he was able to stain with carmine. He also states that the dentinal fibers are formed from the nuclei (germinal matter) of the cells, while the basis-substance of the dentine represents his formed material, which substance calcifies in the form of small globules, gradually increasing in size, and often several of these coalesce. The formation of enamel, he believes, is accomplished in about the same manner as that of the dentine, but he is opposed to calling the layer of enamel cells *membrana præformativa*, yet states that the membrane raised by the action of acetic acid consists of the altered outer uncalcified part of the columnar cells, which he believes to be Nasmyth's membrane. He further says: "There are numerous enamel cells (in describing a specimen) which are calcified in the lower part, near the dentine, while the more superficial portion remains granular, and still contains a large nucleus. The enamel cell increases in length as the so-called nucleus moves away in a direction from the dentine." In the formation of the cementum, Beale is of the opinion that this tissue is not the result of an ossification of the tooth-sac, but that it is formed by cell action identical to the formation of bone tissue. On page 172

Beale enters into the discussion of the homology of the dentine, enamel and cementum, and says: "I look upon both enamel and dentine as calcified 'epithelial structures;'" coming to this conclusion through the fact that dentine has a greater resemblance to epithelium than bone; also, that hairs, like teeth, grow from follicles.

A very interesting case of healed fracture of a tooth, with a new formation of enamel, is found in Virchow's Archiv. (Bd. 38, Heft. 4), by H. Hertz. The tooth was extracted by Brücke from the mouth of a servant girl eighteen years of age, who at the age of eight had a fall, when the tooth, a left upper lateral, was fractured. The crown of the tooth, after this accident, was directed outward. Hertz describes the probable healing process of the dentine and cementum, but is unable to explain the new formation of the enamel which was observed upon this tooth. He also published an article in *Deutsche Vierteljahrsschrift für Zahnheilkunde*, 1870, page 181, on tooth fractures, in which he gave the history of fourteen healed fractures of teeth.

E. F. Wenzel, who wrote an extensive article on researches about the enamel organ and the enamel of animals (*Archiv der Heilkunde*, 1868, page 97), in describing the enamel cells of a sheep, says (page 101) that sometimes he observed a light rim on that part of the enamel cells which lies toward the enamel, but that he was unable to observe anything like the *membrana præformativa* described by Huxley to be present between the enamel cells and the enamel prisms, for the purpose of excreting the enamel.

Carl Wedl (*The Pathology of the Teeth*, Philadelphia, 1872), regarding the formation of the enamel, holds the opinion that it is produced by direct calcification of the ameloblasts (enamel cells) into the enamel. In regard to the enamel organ, he observed that with the growth of the tooth it becomes thinner, and finally shrivels up completely. His views concerning the formation of dentine are that "as soon as the connection of the dentinal with their formative cells occurs, the calcification of the dentinal cells begins; their principal and accessory processes remain attached and are transformed into dentinal fibers." Wedl is convinced that the odontoblasts are the only formations capable of producing dentine, and when this occurs in places where no odontoblasts are present, it can only be done by an inversion of the odontoblast layer (*membrana*

eboris). The occurrence of the globular territories in the dentine he explains as the result of a coalescence of separate groups of calcified dentinal cells. On the formation of the cementum he says: "At the margin of the crown the dental sac contracts, and upon its inner surface the formation of the cement is effected, increasing gradually as the formation of the root advances; the lower segment of the dental sac becomes, therefore, the root membrane of the tooth." On the structure of Nasmyth's membrane he agrees with J. Tomes, viz., that it belongs to the cement.

(TO BE CONTINUED.)

CROWN AND BRIDGE-WORK.

BY DR. F. T. VAN WOERT, BROOKLYN, N. Y.

READ BEFORE THE CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

It is with some apprehension that I present the subject of Crown and Bridge-work for your consideration to-night, but if you will kindly bear with me I shall endeavor to convert you to the belief of that old adage, "there is nothing new under the sun," not ignoring the fact that there are those who advance claims to the invention of the great and scientific system known in our profession as Crown and Bridge-work. It seems to me that these so-called inventors are simply elaborators of that which had been discovered many years ago, notwithstanding the fact that the Supreme Court of the United States has endorsed them as being the originators, thereby placing in their hands an exclusive right at the expense of the profession at large. I refer to the International Tooth Crown Co. Now, while Bridge-work is not a part of my practice, I think there are many cases where it could be applied to advantage; but, knowing the unsettled state of these so-called patents, I have kept myself free from the possible chance of a suit at law, and my patients from the annoyance of publicity by having their mouths made a subject for newspaper criticism. To artificial crowns I have given a great deal of time, thought and labor, in the perfecting (not inventing) of the process for their construction.

In searching for something new upon this subject, my attention was called to a work published by Messrs. Carey, Lea & Blanchard, of Philadelphia, in 1835, the title of which is, "A System of Dental Surgery, in three Parts," by Samuel Sheldon Fitch, M. D., Surgeon Dentist, from which I have taken the following extract.

"OF THE MANNER IN WHICH ARTIFICIAL TEETH SHOULD BE INSERTED IN THE MOUTH WITH LIGATURES.—These are made of silk, or fine gold or silver wire, and are passed through the tooth or teeth which we fasten in the mouth. When the artificial tooth or teeth are placed in the position we wish them, the ligatures are carried around the two adjoining living teeth, and tied so as to be firm in their places." I simply mention this clause to show that metal was used to fasten artificial teeth by means of surrounding the adjoining living teeth. The fourth method distinctly speaks of fastening several teeth to one or more roots, viz.:

"OF PIVOTS.—This is the fourth mode of fastening individual artificial teeth, and is, without any doubt, the best mode in which artificial teeth can ever be fastened in the mouth. The pivots are passed into the stumps of teeth, having the crown of a tooth attached to them, and may be done in this way so as to be perfectly firm, and remain useful to the patient for many years. We sometimes fasten several teeth, united in a block, upon one or two stumps. The advantages of this mode over every other is, I believe, now generally admitted. Clasp springs and plates united may be worn with the greatest pleasure, but the stump is the better mode, if sound and firm; if not, pivots should be fastened in them."

This book has also illustrated plates of this class of work, which I had expected to have the pleasure of showing to you this evening, but unfortunately Dr. Parker, to whom they belong, is very ill, and I did not feel like assuming the responsibility of bringing them here without him. Dr. Parker has been approached for the purchase of this book, and as the sum offered was very large, he is suspicious that it was by an agent of the International Tooth Crown Co.

Now that I have given you the most important points of my paper, permit me to present to you my system of crowning teeth. My first care in these operations is the preparation of the parts to be restored. After pursuing the usual course of excavating and

cleaning the root or roots, I proceed to fill the apex of each root with a paste made from a formula furnished by Dr. Lord, of New York, viz.:

Iodol,	grs. xx.
Zinc Oxide,	grs. xxx.
Vaseline Car.,	q. s.

Mix to form a stiff paste.

Over this I place a covering of Dawson's oxy-phosphate, the paste and phosphate occupying about one-third the length of the root. I am speaking now of cases where a dowel or pivot is used, leaving two-thirds for the accommodation of the pin, which is all-sufficient for a crown adjusted in the manner I am about to present. I trim the root down to a proper shape, take a Logan pin and cut from the small end enough of it to allow it to rest upon the phosphate, with the large end protruding about one-sixteenth of an inch. Then from a piece of 22 K., No. 29 or 30 gold plate, I cut to shape, or very near it, a cap through which I drive a punch, resting it upon a block of zinc; this punch being a trifle smaller than the pins, and shaped like them, will allow the pin to pass through the cap about three quarters of its length; this is to be placed in the root and driven home with a mallet, using for a drift a piece of orange wood, such as is furnished by the dental depots in bundles.

We now have the pin adjusted in the cap to its proper length, and by holding it firmly in place with the drift used, the gold is to be burnished to the form of the root; then removing the pin and cap together, they are soldered with 20 K. solder over a Bunsen flame or spirit lamp. After soldering, replace the pin and cap upon the root, and with a plug finishing bur (sugar loaf, No. 243) trim the cap to the exact size of the root, and cut the pin from the upper surface so that it is flush with the top of the cap. Now select a plate tooth of the proper shape, size, and color, back it with 22 K. gold and grind it to fit the cap. Dry the parts and wax the tooth fast with ordinary base wax, remove and invest in pumice and plaster, about equal parts, trimming it down so that there is a covering of about one-fourth of an inch all round. The wax can then be removed with the point of a knife. Place it over or in the fire until the piece is thoroughly dried, then flow upon it 20 K. solder to the thickness required. After removing from the in-

vestment, the gold work should be trimmed and contoured with suitable corundum wheels, and polished with Dr. E. Parmly Brown's moose-hide points. I then barb the pin with a common knife, cut a few irregular grooves in the root, and set the crown with Dawson's Cement. This last, the operation of setting, is very pleasing to the operator, as the crown will go to its place without the least difficulty; in fact, it is almost impossible to get it wrong after once properly adjusting or fitting it.

The advantages I claim in this over other systems are the following: First—The very little skill required to make a true union between the crown and root. Second—The simplicity of the whole operation, and the comparatively short time required to complete a crown of this kind—about one hour from the time your patient takes the chair until he is ready to leave it; there is no pain connected with the operation, and very little, if any, fatigue. Third—You have in this crown all the virtues of the band-cap crown, besides its better appearance, which your patient will concede at once, and you can dismiss him feeling perfectly sure of the stability of your work, and not apprehensive of a visit from him in a short time, with the declaration, perhaps made before waiting patients, that the tooth is off.

Having thus briefly spoken of my method of crowning the six front teeth with the combination of gold and porcelain, permit me for a few moments to call your attention to the crowning of bicuspids and molars. We all know that these cases vary considerably; where, in my judgment, it is practical, I use in preference the gold band with a porcelain tip, but in many cases I find it impossible to get the required strength in this manner, and as a consequence resort to the all-gold crown, which we know is ever reliable and can be depended upon, if properly adjusted, and in the construction of this I claim a little originality.

After preparing the root I make of 22 K. gold, No. 28 plate, a band of sufficient width to allow a perfect clearance of the crown floor. I select a natural tooth (of which I have a sufficient number at my command) that will give me the required contour. I then take the thinnest platinum I can get, which is about like the rolled gold that is sometimes used in finishing fillings, and burnish this into and around the crown of the natural tooth, trimming it down with a pair of curved scissors. I throw into it a little powdered

borax and scrap gold of 22 K., and hold it over a Bunsen flame until it has melted and flowed, adding to it a sufficient quantity to completely fill this platinum mould. Then with a No. 4 Grobett file I cut the lower surface perfectly straight. The ring having been filed in like manner, I place it upon the crown and solder with 18 K. solder. I then take a piece of pine wood, and with the gold mallet drive the band into the wood to the floor of the crown; then with my penknife I trim off the outside of the wood so that I can get at the crown, and with a file of a suitable cut I file off the platinum and surplus gold, using plug finishing burs in the crevices and curves that the files will not touch. This leaves me a crown of all 22 K. gold, and solid from the root to its top, which I set in the usual manner.

ORAL SURGERY.

BY R. C. BREWSTER, M. D. S.

READ BEFORE THE BROOKLYN DENTAL SOCIETY.

Of all the departments within the wide scope of our profession, I know of none more deserving our attention than Oral Surgery, or one which is so largely neglected. In selecting a subject for writing, I have determined to narrate some cases that I have seen in hospitals and dispensaries, and discuss them from a pathological standpoint. Such patients, however, as one meets there, are always unsatisfactory, as they are likely to disappear as soon as made comfortable. In the event of a return of the disease, they are quite as likely to go to some other similar institution; these people are very properly called "rounders." Then, too, the physical standard of such patients is far below those in private practice, caused largely by poor dwelling places and insufficient food and clothing. However, sufficient can be seen to obtain a general knowledge of almost every case that presents itself.

The first case of importance that came under my observation was that of a German girl, about fourteen years of age, fairly well developed, suffering intensely from a swollen face which completely

closed the right eye, and also from the extreme heat of the August weather. On examination, I found the crown of the right superior second molar broken off, the other teeth being apparently good. I extracted the roots, but no pus followed. On closer examination I found the first bicuspid opaque and extracted it, and a copious flow of thin, dark, fetid pus shot out as if from great pressure. The discharge continued so long that I told her to come again the following day, instructing her to keep the cavity open and allow a free discharge. She came at the appointed time, and I was able to make a thorough examination, and found the cavity opened into the antrum, which was unusually large, due to the bulging out of the anterior wall from the extreme pressure of the fermenting fluid within, and whichever way I turned the probe it grated as against the side of a brick, but I could not pass it into the nasal cavity.

No history of the case could be obtained, other than that she had suffered from toothache for about three months. I conducted the patient to the surgical department, where a consultation was held, and they decided to operate by making a sufficient opening and to remove the necrosed bone by a bur, to all of which her parents consented. On further deliberation wiser counsel prevailed, and it was deemed prudent to wait until more favorable conditions could be obtained and the patient's extremely debilitated condition could be improved, and also for cooler weather. In the meantime I was to have charge and do what I could for her by the use of aromatic sulphuric acid. I accordingly instructed her how to prepare a fifty per cent. aqueous solution of the acid, provided her with an ordinary rubber syringe, and told her to syringe it out thoroughly twice a day, first with a good supply of tepid water and afterward with the syringe twice filled with the acid, and also to keep the opening tightly packed with absorbent cotton to enlarge it, and to return each week for further instruction. I also gave her for constitutional treatment syr. iod. ferri., ten drops, t. i. d. and plenty of good nutritious food, such as beef, soup, milk, eggs, etc., from the diet dispensary.

I saw her about once a week during the next three months, and at the end of that time she had no need of any surgical operation. The flow of pus had entirely stopped, and the opening was closed. The bulging out of the superior maxillary bone remained the same, and does to this day.

Another case was that of an Italian woman, about forty years of age, who had a swelling on the left side of her face, slight, however, as compared with the other, and who came to ask for some medicine to take a bad taste out of her mouth. With a hectic flush upon her cheek and a deep cough, there was no difficulty in diagnosing hers to be a case of consumption. She was neat and clean, with well developed features, but the odor from her mouth was very bad. She also complained of toothache on the left side of her face, and I found, on examination, that the teeth from the superior centrals to the second molars were either badly decayed or broken off, and the gums greatly swollen. After considerable persuasion she consented to have them extracted, which resulted in extensive hemorrhage, mixed with pus, the character of which could not at that time be distinguished.

After the hemorrhage had sufficiently subsided, she was told to come the next day, when the diagnosis was very simple. Through the sockets of the eye tooth and first and second bicuspids, the handle of an excavator readily passed to the floor of the orbit, with the same sense of roughness that always denotes necrosis. There was still a copious flow of sanious pus, and after thoroughly evacuating the antrum and syringing it out with a four per cent. aqueous solution of carbolic acid, she was told to come the following week, that being the earliest time she had at her disposal. She was given a sufficient amount of aromatic sulphuric acid, diluted one-half with water, a syringe and cotton, and told to syringe it twice a day, and to pack it with cotton after each dressing, and no doubt she did, for at the end of a week she returned, and complained that her face was very much worse; that she had done exactly as she had been told, and had put a piece of cotton in the hole twice a day until she could no longer get any in! She had forgotten to remove each piece that was put in the time before, and had been simply adding piece after piece, twice a day, until no more would enter. Consequently, the use of the syringe had been of no effect. I found, on examination, that the antrum was packed very closely with cotton, and it required a long time to remove it, the odor at the same time being dreadful. The disturbance was now very greatly increased from the pressure of the cotton against the floor of the orbit, producing orbital cellulitis, and the patient was sure she would lose the eye. Such, however, did not prove to be

the case, for at the end of another week, with thorough cleansing and proper drainage, all inflammation around the eye had entirely disappeared. I also noticed considerable exfoliation of the alveolus, which was easily removed with an excavator. At the end of another week a large portion of the superior maxillary bone had also exfoliated. It was the anterior inferior portion, from the canine fossa to the anterior nasal spine, including a portion of the palatine process. Some difficulty was experienced in removing this piece, as the gums had to be laid open, and the edges were very ragged and sharp, which caused considerable hemorrhage. However, after diligent effort it was finally removed, and the hemorrhage stopped by compression.

I gave her the aromatic sulphuric acid dressing, with syringe, etc., and after some trouble in teaching her how to use it, soon began to see its good effects. In about another month the discharge had entirely ceased, and no trace of necrosis could be found. The opening at the canine fossa was about one quarter of an inch in diameter, and the passage from the antrum into the nasal cavity about the same.

I now made for her a partial plate which so restored the fullness of the lip that the deformity was scarcely noticeable, and aside from the annoyance of cleaning the cavity after each meal, she had no trouble. For constitutional treatment I gave her *syp. iod. ferri.*, ten drops three times a day, and cod-liver oil.

I am fully aware of the popular prejudice against aromatic sulphuric acid for such cases, but I have found that patients will use that when they will use nothing else, and the results have been entirely satisfactory. No one will attempt to dispute the advisability of this treatment over an operation with the knife in these two cases.

Another case was that of a puny, sickly boy of four years, who had to be carried in his mother's arms to the dispensary, and who had the same aromatic sulphuric acid treatment for necrosis in his right inferior maxillary, which exfoliated a piece of bone an inch and one half long and one quarter inch wide, and the treatment resulted in complete recovery in three months. An operation with the knife could have made no better result, and, to say the least, would have been injudicious. The character of the discharge of the first two cases, thin, dark and fetid, I have always found the result of necrosis.

SOCIAL CULTURE FOR DENTISTS.

READ BEFORE A UNION MEETING OF THE 6TH, 7TH AND 8TH DISTRICT DENTAL SOCIETIES HELD IN BUFFALO, OCTOBER, 1887.

BY DR. W. F. ARNOLD, ROCHESTER, N. Y.

Every man who starts out in a professional career desires to be successful. To attain this end many qualities of mind and heart are needed. Good work and careful training in the various departments of the profession are not sufficient in themselves to give the full measure of success, though they are very important factors. What is needed is the rounding out of a man's social nature, and this can only come by careful culture. We owe to society a debt that must be paid, if we expect to collect our debts from society. This being the case, is it not a wise provision on your part to court and win the good-will and favor of a power so potent in its ability to pave the way to fortune and prosperity, or to sink you in hopeless ruin and adversity?

You may ask, how can this be accomplished? I answer, *first*, by being worthy; *second*, by showing your worth, as nothing tells like good work honestly and well done; *third*, by cultivating the social part of your nature, by smoothing off the rough corners, and by polishing up your intellect, manners and general address. It is well to have a few rules for every-day use in the matter of social culture.

First. Let no day pass without adding some new fact or thought to your store of information.

Second. Inform yourself as to the best usages of good society.

Third. Scrupulously keep this code of ethics.

Fourth. Attend strictly to your own affairs and guard against meddling with those of others.

Fifth. Choose good society and reject any that falls below your standard of right.

With these rules, go forth to create for yourself a place and name in the ranks where you would like to be known. The dentist should be entitled to enter the best circles of society, and he is, when he has complied with the requirements of their code. You will not find the doors to any circle open all at once. It takes time, and depends upon the tact of the person seeking admission through certain forms and legitimate introductions.

Man belongs to the gregarious type of animals, and when left alone becomes eccentric and odd, and exhibits many of the selfish traits of character seen in the lower orders of the brute creation. Look at the man who confines himself to his counting room and business entirely, and it will not be long before you will see some of the characteristics of the hog family developed in him.

The three great divisions of the social life are home, general society, and professional or business associations. The social home life should be the highest, the sweetest and dearest to every American heart. Here the tender love, the generous sympathy, the happy greeting, the sweet smiles of friends and family make the soundest institutions of our country. Here should be the cradle where the happiest manners are born, the truest and best friendships formed, where the kindest words are spoken and the most done to bring the ideal life of the best society to perfection. Without this effort at home to subdue your irritable and selfish dispositions, your future successes in society will be only shams of the most hypocritical order. Home is the foundation of our American institutions, and when the home-life becomes less sound, sweet and attractive, you may be sure there is social rottenness, and it will break out in social ulcers, which will sap all true social life. The two dearest words to Americans are Home and Mother; I count the moral downfall of any man from the day he repudiates these holy words, whether it be the home of his own mother or that of the mother of his children.

Society life is next to the home life. Every one needs some relaxation after the racking brain or muscular work of each day. I do not mean, when I recommend society, that you, as professional gentlemen, shall follow all the frivolities of fashionable life. You cannot afford the time or expenditure necessary to meet such demands. But I mean, when I recommend society for culture, that it shall be among good, sensible people, who recognize the fact that the night was made for sleep. This class is the thinking class, the reading class, the intelligent class, that make men sound, sweet and strong. These are the people who move the world and hold it in equilibrium. This circle comprises the busy people, who are working in churches, in reforms of all kinds, in the sciences and arts, and the broad fields of literature and education. They are the people who are living to some purpose, and in this class I recommend you to find your friends.

The claim has been made that dentists are, as a class, not very social among themselves—that they are kept apart by petty local jealousies and animosities, really beneath the notice of cultured gentlemen. If these conditions really do exist, no time should be lost in trying to heal old wounds and dress old sores till all are well. Then it may be said of us, as it is said of the societies of physicians, that we professionally consult together and help each other in difficult cases with right good-will.

I am pleased to say from my observation, and from what I have gathered from experience of others, that the broad liberal spirit of good-will and brotherly feeling is rapidly spreading among us, and has been brought about by our frequent meetings in the dental circles. I have been glad to see the growing respect and dignity manifested. Men have learned that no good, substantial structure is reared on the ruin of another. The way to grow socially, as dentists among ourselves, is to attend the city, district and State society meetings. In these we are brought together to contribute our mite to the general good. We get new ideas and are better men for this intercourse. Our societies are elevating in their tendencies, and are growing more and more into dignified, useful institutions. The greatest evil to guard against is the fondness for self-display, and the greed for official position. I could not help feeling, when I attended a great Dental Association, that the principal question seemed to be, for whom are you going to vote? As if the Association was only a body of wire pullers, and its principal object the election of some one to office!

Our social dental clubs, I believe, can be made very useful to promote a higher educational standard and culture among us, provided they do not entirely lose sight of their object, and degenerate into mere drinking and smoking clubs, where the best fellow is he who can tell the most interesting story. The dental club that is a working institution, where papers are carefully prepared and read, where difficult pathological cases are discussed, where matters of interest to the profession are considered, with enough of liberality, and perhaps music introduced to make the evening interesting, is a blessing to all who are its members. Our profession is most honorable and useful, and what it needs most is men who honor it by bringing to it a good preparation and a broad, liberal education and culture.

Reports of Society Meetings.

NINTH INTERNATIONAL MEDICAL CONGRESS, WASHINGTON, D. C.
SEPTEMBER, 1887.

SECTION XVIII, DENTAL AND ORAL SURGERY.

REPORTED FOR THE INDEPENDENT PRACTITIONER, BY "MRS. M. W. J."

CONTINUED FROM PAGE 87.

FRIDAY AFTERNOON SESSION.

Dr. W. W. Allport moved that, in order to hear all of the remaining papers, there be no more general discussion.

Dr. A. E. Baldwin hoped the motion would not prevail, as it would cut off those who might have valuable thoughts to offer. He thought it better to get all the good possible out of one paper than to hurry through many.

Dr. Atkinson agreed with Dr. Baldwin. There was no value in accumulating a great mass of material.

Dr. Allport withdrew his resolution.

A paper was then presented from Dr. E. Andrieu, Paris, president of the Odontological Society of France, on "The Sixth Year Molar." An abridged translation of the paper was read by Dr. L. D. Shepard, of Boston, Mass.

In this paper the first molar was considered as a "tooth of transition," whose period of usefulness is limited to the time of shedding the deciduous teeth. That it is not designed as a permanent tooth he considers proved by the fact that it originates in the epithelial layer like the other deciduous teeth, and not from a bud connected with the preceding teeth, the permanent second molar springing from the "deciduous" sixth year molar. The function of the latter he conceives to be limited to the work of defining the space to be occupied by the "teeth of replacement," and of maintaining the articulation at the desired height until the anterior teeth and the second molars are in place. After that he thinks it is not needed, and its retention injurious; that it should be extracted without hesitation, seventy-five out of every hundred decaying early and injuring the neighboring teeth as well as the general health. From his examination of one hundred mouths, he found only two adults with the four first molars in good condition; eleven

with three; thirty-one with only one good one, and fifteen with some remains of first molars; in forty-one they were entirely gone. That this should be the case he thinks only to be expected from their inferior density, from the external configuration of the crown, from the acid fluid in which they are bathed during the period of displacement, and from the proximity of the second temporary molars "which are always decayed before they are shed." Their coefficient of resistance is less than in the other teeth whose density is greater. The acid condition of the mouth he attributes to the fact that "the interstices of the temporary teeth are packed with decaying, fermenting food," constituting them "sinks of infection."

The decay of the second temporary molar injures the first molar, which, in its turn, affects the permanent molar; its retention also crowds the space and leaves no room for the wisdom tooth; being crowded, it erupts with a facial inclination favoring the lodgment of food to the injury of the second molar. The removal of the sixth year molar banishes all other causes of deterioration. He concludes that the sixth year molar should be retained only when it is of superior structure, showing no signs of decay, and the jaws amply large to accommodate the thirty-two teeth without crowding, but these cases he finds very rare.

He finds, in most instances, abscesses from the decay of the first molar in the first year after eruption. When room is needed for regulating, the sixth year molar can always be spared. If the permanent central incisor erupts in front of or behind the arch, he would sacrifice the temporary lateral. Then, if the permanent lateral has not space, he recommends the sacrifice of the temporary canine. The sixth year molar having been extracted, when the temporary molars are shed or extracted the bicuspids will have plenty of room. "This rule makes success easy." The proper time to extract the sixth year molar he considers to be when the second molar is about to come through. If necessary, it should be filled and cared for until then. The recent fashion of no-extractions has resulted in causing havoc in many mouths, with abscesses, swelled faces, and heads tied up, and dictates a return to the plan of extracting the sixth year molar.

The discussion of this paper was opened by Dr. L. D. Shepard. He said, had this paper not come from across the water, but been

presented by one of our own people, it would not have been deemed fit to go on record as an exemplification of modern dentistry. He was sorry to have to pronounce such a severe judgment, but the paper advocated a return to the practice of twenty-five, or rather fifty years ago, when the sixth year molar was extracted promiscuously. The results of modern practice prove that with thirty-two teeth in the mouth, only due respect is paid to each one. No tooth, any more than any other suspected violator of the law, should be condemned without trial by jury; it should not be anathematized unless proved a culprit; the thirty-two teeth are all entitled to equal respect. Another fact to be recognized is that extraction is mutilation. Amputation is also mutilation, but when amputation is decided upon it is for a determined reason, and not because it is the right ear or the left, the right eye or the left, and not because it is the sixth year molar or the bicuspid, but the decision should be had upon the study of the laws governing the case. The extraction of a tooth may be a question of expediency, but it should depend upon a lesion of the tooth, the occlusion of the jaws, or the arrangement of the teeth. It should be as the result of some abnormal condition, not physiological, but pathological. Even admitting the sixth year molar to be a tooth of transition, a method of practice based upon one condition only has a very contracted foundation. If it is a tooth analogous to the temporary teeth, if a mere tooth of transition, why was no provision made for its self-extraction, by exfoliation or the absorption of its roots? This is sufficient argument to prove it a permanent tooth.

Dr. Andrieu's tables of the frequency of decay are analogous to tables of the deaths from small-pox if all smitten with the disease were allowed to die without any care, nursing or medicine. To judge fairly we should have the ratio of their preservation in adult life, when all preventive and remedial means have been employed. At the age of fifty years we will find more six year molars than bicuspids, where all have had the same care. It has as good a prospect as any other tooth, excepting only the canine. Hence, in his practice, Dr. Shepard said that he always insisted on giving the sixth year molar the same respectful consideration that he gave any other tooth, beginning with its eruption.

Dr. Paul DuBois, of the Dental School of Paris, said that he did not share Dr. Andrieu's opinions. He could not believe that the

sixth year molar had the characteristics of a first tooth; it was the most feeble tooth, he thought, and should receive the earliest attention, and be extracted only at the last extremity. Its extraction changes the whole articulation. In the civilized races we find the jaws narrowed, with no place for the wisdom tooth; we should not aid that tendency to narrow the jaws still more, interfering with mastication.

Dr. Horton, of Cleveland, Ohio, instanced the cases of his two sons. For one he filled the sixth year molars as soon as they began to decay, and at the age of thirty-five he has his thirty-two teeth; for the other he extracted the sixth year molars at the age of eight or nine. But when the third molars erupted they found no room, but were forced into the masseter muscles, occasioning severe pain, and, at the age of thirty-four, as handsome third molars as were ever seen had to be extracted. Age, sex, the general condition of the mouth, the size of the jaws, must all be taken into consideration before extracting. Nature has given thirty-two teeth because she wants them all. The temporary teeth should be filled with the first appearance of decay; before the age of three years is not uncommon now, where we have control of whole families.

Dr. Frank Abbott, of New York, said that in reference to the question whether the sixth year molar was a permanent or a temporary tooth, two points were essential. The assertion that they are not as well calcified as the second or third molars was entirely gratuitous. Under the microscope the temporary and permanent teeth are quite different. In the former the canaliculi are larger, but there is no such difference between the sixth year molar and the other permanent teeth. Dr. Andrieu assumes that it is a temporary tooth, or tooth of transition, and should be removed because it originates from an independent bud in the same manner as the first teeth. But there is this important difference—from the temporary teeth the bud goes down and the second tooth comes from underneath, but from the sixth year molar the bud projects horizontally for the second, and from the second to the third in the same way. They are all intended for permanent teeth, from the first to the last of the three.

A paper was read from Dr. Thomas David, Director of the Paris Dental School, on "Apthous Stomatitis and its Origin."

Dr. DuBois then tendered an invitation to the members of the Sec-

tion to attend the National Congress of Dentists in Paris, in 1889, which would be a grand occasion, where they would be received with a welcome such as he and his confrères had received at the present Congress. The profession in France were all united in tendering the invitation, and desirous of a large attendance.

Dr. John S. Marshall, of Chicago, read a paper entitled "Operation for the Cure of a Persistent Neuralgia of both Temporo-Maxillary Articulations, and Reflected Pain in the Right Brachial Plexus, of Eight Years' Standing, with Results." After enumerating a long list of causes of neuralgia, the case in hand was found to be a peculiar one, and due to mal-position of the parts from the removal of a large section of the maxillary bone, for an osteo-sarcoma, three years previously. The maxillary bone having been removed, from the first bicuspid nearly to the angle of the ascending ramus, an ugly cicatrix had been left, and the jaw carried back to the right until the median line was an inch from the centre. There had been fibrous union, but this afforded little support. The mouth could be opened only three-fourths of an inch, and the patient—a seamstress, forty-two years of age—suffered severe paroxysms of pain in the side of the jaw, extending to the shoulder and down the arm. She was wearing a full upper denture. The case was diagnosed by Dr. Marshall as one of phagedenic pericementitis, due to the contraction of cicatricial tissue, and he decided to make an operation for the relief of the mal-position of the jaw. Removing the fibrous tissue in the mouth, the jaw was carried back into proper position and the wound packed with sterilized sponge. The $\frac{1}{1000}$ bichloride of mercury solution was used as a mouth-wash every two hours, and it was hoped that the sponge would organize. As long as the sponge remained in place there was no recurrence of the pain, but suppuration took place and the sponge had to be removed, when the pain returned in her shoulder, but not in her arm. Another method was then tried. A gold crown was fitted to the bicuspid, to which one end of a gold rod was soldered, the other end having a screw thread fitting a hole drilled in the ramus. The rod was one-eighth inch in diameter and one and one-eighth inches long, and held the jaw in its normal position. An artificial bridge denture was then constructed to fill the space and counteract the pressure of the bicuspid holding the rod. The first operation was made in March. On the 17th of May an incision was made externally, in

the line of the original cicatrix, with two objects in view; first, to try bone-grafting from the outside, and second, to get rid of the old scar tissue. A flap of periosteum was raised from the bone on one side, and from the ramus on the other, and sterilized sponge inserted, with drainage by strands of floss silk. This again suppurated, and the sponge was removed on the 20th. By the 17th of June the wound had healed, the screw in the ramus occasioning no inconvenience or irritation. On the 3d of September, however, in sneezing, the screw was displaced. The jaw had been carried back half an inch further, and the mouth opened much wider. The rod was consequently too short, and a half inch length of tube was soldered to the tooth, with a set-screw on the rod to hold it to the right length. In January the screw was still firm, with no inconvenience, but a marked improvement in the position and movements of the jaw, the mouth opening an inch and a half. An attempt at bone-grafting was again made, from the femur of a young rabbit. Twelve small pieces of bone, from two to six lines in length, were inserted in two rows across the gap. Every piece attached, and the wound healed without suppuration, and with no drainage; union remained perfect with the ramus, but at the other end necrosis set in after sixteen days, and further attempts were abandoned, owing to the debilitated condition of the patient. In July the screw was displaced in yawning, and the crowned bicuspid had become so loose it was removed. A heavy plate was then made of Weston's metal. There has been no recurrence of pain since May, 1886, but Dr. Marshall said he would have been better satisfied if the reproduction of bone had proved a success. The first sponge graft failed because of septic influences, it having been impossible to exclude the fluids of the mouth. The second failed from using pieces of bone larger than the tissues could nourish. This was an unfavorable opportunity for brilliant success, the patient being forty-two years old, and her vital energies much depressed from long suffering.

There are three principles to be borne in mind in bone-grafting. First, thorough cleanliness, during and after the operation; second, pieces of bone must be very small and covered with periosteum; third, they must be taken from a young and growing subject. If he could have obtained a foetus, or young child just dead, he would have tried human bone. The rabbit died under the effects of the

anæsthetics used. The bone to be used must be immersed in bi-chloride solution $\frac{1}{500}$ at the temperature of the body for five minutes.

Dr. Atkinson expressed his acknowledgments to the author of the paper for his faithful delineation of details. He had laid down clearly the principles involved in bone or sponge grafting, and had exposed the folly of the old methods of using any kind of drainage. Whenever we use drainage we open the way for retrograde metamorphosis—material to be wept out. He regretted that there was not a whole day in which to discuss so valuable a contribution. There was a little of the holding to effete traditions and inane quotations in trying to define what neuralgia is. It is not neuralgia when it is due to compression. After some further discussion of this subject the following papers were read by title :

“Articulation of Artificial Teeth,” by Dr. H. L. Cruttenden, of Northfield, Minn.

“Power in Dentistry,” by Dr. W. St. Geo. Elliott, of London, England.

“Porcelain Crowns,” by Dr. E. C. Moore, of Detroit, Mich.
Adjourned.

AMERICAN DENTAL SOCIETY OF EUROPE.

FIFTEENTH ANNUAL MEETING AT COBLENTZ, GERMANY,
SEPTEMBER, 1887.

REPORTED FOR THE INDEPENDENT PRACTITIONER BY DR. E. A. GALBREATH,
HANNOVER.

CONCLUDED FROM PAGE 91.

THURSDAY AFTERNOON SESSION CONTINUED.

The President announced a paper by Dr. Miller; subject “The Effect of Food upon the Teeth.”

Dr. Miller.—It is not my object to enter into a detailed account of the experiments I have been making on this subject, as they are not yet, by any means, completed. I have found the difficulties vastly greater than I anticipated, and instead of doing the whole work in six to eight months, as I thought I could in the beginning, it will require at least three or four years. The object of my experiments, as I stated at our last meeting, is to determine whether or

not the teeth, either during their development or at any subsequent period, may be influenced by the character of the food given; in particular, by an abundance or by a lack of lime-salts. This I consider to be a question which can be settled by experiment alone, individual opinions being, as then stated, very nearly worthless. It is true that the majority of experienced dentists with whom I have spoken on the subject have answered my question in a positive sense, without, however, being able to give any conclusive evidence; others are of a directly opposite opinion, and for no better reasons. I take this opportunity to state that my object is not to support any particular view, but to obtain results upon which an opinion may be scientifically based. I showed in my paper last year, which was simply an introduction to the subject, that under certain specified conditions the amount of lime-salts taken by children is less than that necessary to properly build up the osseous system. I also made a number of experiments on grown dogs, obtaining results of which I said: "Although on the whole it might appear that a change had been produced in the proportion of lime-salts to organic matter in the teeth, yet the number of experiments is too small and the results not sufficiently positive to admit of drawing any definite conclusions." The annotation on the above communication in the *London Lancet*, as well as the remarks on the same by Messrs. Sewell and Ch. Tomes, produced an incorrect impression of the contents of my article, Sewell even going so far as to make a rather lengthy quotation, which he says is evidently from Miller, but which in fact was not at all from Miller.

During the last twelve months my experiments have been made exclusively on young animals (mice and dogs). Attempts at experiments on cats failed through the premature death of the animals. In each series of experiments the litter of pups or mice was separated into two groups, one of which was fed normally, the other on artificial milk (containing all the constituents of milk except lime), sugar, fat and peptones. You will all be convinced as to the effects of such a regimen upon the bones, as you see the epiphyses are exactly like little sponges, and the shafts can be tied into knots. As for the teeth, I have been very much surprised to find how very little they seem to have been affected, both as to time of eruption and the development of the roots. What the effect may have been upon the chemical composition I cannot state, as the analyses have

not yet been made, nor do I wish to enter into a discussion of the matter until my experiments have been completed. My results, so far, I may say, appear to be markedly different from those of Galippe, who is of the opinion that the teeth are the first to be affected. I found the bones decidedly more altered, at least macroscopically, than the teeth.

Dr. Miller also gave a resumé of the most important papers which have been produced during the year on histological and pathological dental subjects, dwelling at length on the recent communications of Bödecker and Heitzmann in the *INDEPENDENT PRACTITIONER*, relative to the development of the teeth. The views of these authors, as well as the accepted theories, were illustrated by large drawings made by Dr. C. H. Abbot. Dr. Miller represented Drs. Bödecker and Heitzmann as at present standing alone in their views, and as being opposed by some of the best dental pathologists in America, who declared themselves unable to see, even in preparations made by Drs. Bödecker and Heitzmann, what these histologists claim to see, and what Dr. Heitzmann has made so plain in his drawings.

Many other histologists are at present testing the views of Drs. Bödecker and Heitzmann, and in a few months we may hope to hear a conclusive substantiation or refutation of them.

The Society then going into executive session, the following resolutions were offered :

Resolved, That the constitution be so changed as to permit of the next meeting being held two years hence, in 1889, in Paris, the date to be announced by the executive committee.

Resolved, That five hundred marks a year for the next two years be set aside for microscopical researches.

Resolved, That the Society, recognizing the professional devotion and generosity of Dr. Herbst, begs to thank him for his kindness in sending for exhibition specimens illustrating several of his methods of operating.

Resolved, That a committee, consisting of Drs. Jenkins and Crane, draft resolutions expressive of the feelings of the members upon the death of Dr. Abbot.

The balloting for officers gave the following result :

President—Dr. Elliot.

Vice-President—Dr. Sachs.

Treasurer—Dr. Bryan.

Secretary—Dr. Patton.

Drs. Jenkins and Crane here presented the following report, which was adopted and ordered inserted in the minutes:

WHEREAS, It has pleased the Divine Providence to remove by death our beloved friend and colleague, Dr. F. P. Abbot, therefore,

Resolved, That by this event we have lost one who was not only one of the brightest ornaments of our profession, but who had especially endeared himself to the members of this Society by the amiability of his character, and won their highest admiration by the brilliant qualities of his mind.

In presenting this report, Dr. Jenkins said:

The friend whose loss we all so deeply mourn has stood for more than thirty years at the very head of our profession in Germany. He found it a little respected mechanical art: he left it a recognized and honored profession. The position which American dentistry occupies to-day is due, in a degree which none of us can estimate, to his courage, his great skill as an operator, the versatility of his mind, the tenderness of his heart, and his profound conscientiousness. Since early childhood he had been the victim of severe asthmatic attacks. What would have been with a man of less determined spirit an excuse for idleness, was to him but a spur to greater industry and an occasion of active improvement of the intervals of suffering. The achievements of his life would put us unhampered ones to shame, did we not know that he was born a hero. His malady never brought impatient or complaining words to his lips. He saw in middle life his entire fortune swept away by a single blow, and with unimpaired cheerfulness and dauntless courage began life anew the next morning. The friends who had come to speak words of sympathy to him in affliction presently found themselves led to confide to his tender and unselfish heart their personal sorrows, in consoling which he seemed to forget his own. No words can do justice to his charities. I speak not only of his princely charities of the purse, but of that nobler charity of the heart, by means of which he has raised so many of us to higher thought and better living. He was a patriot, and in the dark days of the civil war his house was the rallying point of those who refused to despair of the Republic. He was a Christian, and his life was fragrant with thoughts and words and deeds of piety and benevolence, as he taught by precept and example the fatherhood of God and the brotherhood of all mankind. I love to think of our departed

brother in the words with which Tennyson has painted his ideal knight:—

“Who revered his conscience as his king,
Whose glory was redressing human wrong.
Who spoke no slander; no, nor listened to it.
Who loved one only, and who clave to her;
O, selfless man, and stainless gentleman.”

The President appointed Dr. Miller to conduct the President-elect to the chair.

President Elliot appointed as the Executive Committee, Dr. Crane, Dr. Miller, and by general request Dr. Elliot.

The President appointed as the Membership Committee, Dr. Sachs, Dr. Jenkins, Dr. George.

As Committee on Dental Education, Dr. Miller, Dr. Patton, and upon motion Dr. Elliot.

The Society then adjourned.

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

REPORTED FOR THE INDEPENDENT PRACTITIONER.

Dr. F. T. Van Woert, of Brooklyn, read a paper on Crown and Bridge-Work. (See page 121.)

Dr. Van Woert made the following additional remarks during and after the reading of his paper:

Since adopting this system of crowning, I find that a similar crown had been devised by Dr. Richmond. It is an all porcelain crown; the labial and palatine surfaces of the root are beveled off, and the crown is supposed to fit that bevel. The principle is, I think, virtually the same, although I knew nothing about this when I devised mine, and I am sure Dr. Richmond knew nothing of my system.

I do not see how it is possible to grind such a crown to the root. After you have the root prepared, you can prepare the crown to make a true union between it and the root. Dr. Richmond may be very successful with his crown, and I have no doubt he is, but I do not think it is a practical thing in the hands of the general practitioner. It is beyond my skill, and I want something which I can manipulate with a fair chance of success.

Concerning bridge-work, so long as there is a question of the validity of the bridge patents I do not want to have much to do with it. But with a crown of this kind, the two upper canine roots

would support a bridge as well as if they were banded. With that overhanging edge, it would be impossible to break it, and where it is practical at all, I think it is much easier to make than a band crown.

Dr. Stockton—Is it not rather expensive to fill bicuspid crowns up with gold?

Dr. Van Woert—You generally have plenty of scrap gold in the office that you can use for that purpose. I have here a complete copy of a chapter in Fitch's Dental Surgery, which describes this bridge work, and at some future day Dr. Parker will be only too glad to show you the book containing it. I do not want you to infer that I claim this to be a better crown than Dr. Knapp's. I confess that I am not the mechanic that Dr. Knapp is, and therefore I have to make something that I can use, and that will be equally serviceable.

Dr. Osmon—I have examined Dr. Van Woert's work carefully, and I think it has some marked advantages over the band method. I have found that these band crowns, where the band goes under the gum any distance, are a source of irritation, and I have gone back to my first love, the Bonwill and the Howe crowns. In this all gold crown I must say that there is a great waste of gold, but Dr. Van Woert was always a very generous fellow, and he throws in the gold very freely. I think that the shell crown, covered with eighteen carat gold solder on the inside and then put on in the usual manner, will meet all the requirements that a solid gold crown will, and at a great deal less expense.

Dr. Evans—I have a work of Dr. Fitch that describes the identical things which the gentleman has quoted. I showed it at a meeting of the First District Society in New York, two years ago. But the bridge-work done now is entirely different from that which is explained in that work. It is useless to say it is the same thing.

I am not an advocate of patents. I have patented some things myself, but I have extended their use to the profession. I refer to the contour seamless crown of my invention. Dr. Low suggests a bridge on two points to which it is attached with cement, and to that bridge which spans the space artificial teeth are fixed in a rigid manner. Nothing like this was ever done before he applied for his patent. I have seen what you would call bridge-work dating as far back as 1867—such a piece as Dr. Fitch describes. But it has no relation to the bridge-work of the present day, and we den-

tists will never win a suit against the Tooth Crown Company on any such argument as that. The courts will not accept it. You must keep down to what the patent really is.

As to the crown that has been presented here, I have made crowns on that principle for years. I trim the root as he describes, take an impression of the end of the root with some moldine in a tube which is curved so as to fit over it, and from this I make a die. I then hammer over this a piece of lead, which gives the exact shape of the root. I then trim away the labial portion, if it laps over much. When fitted and put in place it makes a most excellent crown. It is in principle about the same thing as that shown here.

Dr. Van Woert—I think the gentleman misunderstood me. In speaking of that book I distinctly said that several teeth were supported on a plate by means of pivots or screws in the stumps of two or more teeth. If this is not a bridge I do not know what is. It is supporting several teeth across a broken arch without touching the gums. With respect to the making of crowns, every man has his own method. As for myself, to take an impression of the root and work from that impression only complicates matters, and I cannot do as well as I can to work from the root direct. The gentleman who has just spoken may be able to work from an impression with accuracy, but I cannot. I simply give you my method, which, to me, is an easy and good one.

Dr. Evans.—I first take an impression, then stamp a cap and adjust this to the root. That facilitates the operation considerably. It fits at all points. Regarding bridge-work, I do not mean to say that the principle of the bridge is new. On the contrary, it is one of the first principles that ever was adopted in the insertion of artificial teeth. You will find it mentioned away back in Roman and Grecian history. But the improvements upon that principle, as embodied in the patents of the International Tooth Crown Company, are new. That is the real point in this matter. I have a copy of a book by Dr. Fitch which gives such a description of a bridge as has been read by Dr. Van Woert, but my copy was published in New York, not in Philadelphia. I think Dr. Bödecker has a work by the same author.*

*The work of Dr. Fitch is somewhat rare, but it is not unique. We have a copy, and there are doubtless others in existence that are not mentioned. The first edition was published in New York, in 1829, the second in Philadelphia, in 1835.—EDITOR.

Dr. Weld.—I would like to ask the doctor if the crown he advocates preserves the root as well as a crown which is associated with a band; whether a band in connection with the cement is not an additional security to the root of the tooth.

Dr. Van Woert.—If it were properly trimmed below the margin of the gum, it might be better. If you get a perfect union between the root and the crown, I think it will be successful in ninety-nine cases out of a hundred, provided the root is sound. Dr. Stockton seems to think that a shell crown is as good as a solid gold crown. Possibly it is, but to make a die and strike up a crown takes more time than it does to burnish in the platinum and fill with gold, and the time is worth a great deal more than the gold. That is the reason I adopted this system—simply to save time. I can make a crown of that kind and put it on in three-quarters of an hour.

Dr. Osmun.—I have been wondering if a bridge made on this principle, with the cap cemented to the two attachments, would be covered by the patents of the International Tooth Crown Company. The Low patent covers a band around a tooth, cemented with some kind of cement.* A cap over a root, with a bridge thrown from it to another of the same kind certainly is not a band around a tooth. The important question is, whether under the Low patent the International Tooth Crown Company can compel dentists using this cap to take a license and pay royalties. I am not a believer in bridge-work in any sense of the word. I have put in a few bridges and have paid the royalties on them, and in every case, with a single exception, the roots have loosened in their sockets. The crowns have not loosened from the roots. The one that I relied upon as the best piece came in the other day, and the roots were so loose that I shall have to extract them. The question is, whether this device that has been presented by Dr. Van Woert would not obviate the necessity of paying royalties under the Low patent, for those who like to do bridge-work. Personally I do not

* The vital paragraph of the Low patent reads as follows:

"What I now claim as new is: The herein described method of inserting and supporting artificial teeth, which consists in attaching said artificial teeth to continuous bands fitted and cemented to the adjoining permanent teeth, whereby said artificial teeth are supported by said permanent teeth without dependence upon the gum beneath."—*Error*

believe in making two or three broken down roots do the work of seven or eight teeth.

Dr. Luckey.—I am not quite clear as to how Dr. Van Woert makes the union between the crown and the root, and where the cement goes. In fixing the metal cap over the end of the root, do you make allowance for the cement between them?

Dr. Van Woert.—It is but a very thin film and would take years to wash out. I have yet to see a root that is decayed under such a cap, except through defective workmanship. I have had them decay, but it was my own fault and not that of the crown. If the gold cap be properly adjusted to the end of the root, and fits accurately, I doubt very much whether caries will ever be found there.

Dr. Luckey.—You depend for your union upon the little cement that finds its way into the joint?

Dr. Van Woert.—Yes.

Dr. Luckey.—Would you unite a Logan crown in that way?

Dr. Van Woert.—I think you would get the same result, provided the union was as nearly perfect.

Dr. Palmer.—Speaking of the gold crown makes me think of a crown that was described in the October number of the *Cosmos*, in the construction of which the Logan crown is used, combined with a cap, forming a perfect all-porcelain crown. The gentleman describing that crown cuts the root off straight across, a little below the margin of the gum, then makes his cap for it, similar to but very much shorter than the Richmond crown, and with the same diameter at this point as in the centre. After the necessary curving of the band beneath the gum and fitting it to the root, it is driven into position. He bevels the roots off the same as in setting the Bonwill crown, using very thin gold and working it down with burnishers. He gets a cap smaller in diameter, and fitting very accurately to the end of the root, then punches a hole through it, and in this canal fits a pin; then taking a Logan crown he cuts the pin off just about even with the edges of the depression in the crown, and flows on pure gold. That he fits perfectly to the outline of the cap or root, then cuts the end or heel of the Logan crown off so that there is just the least opening at the back, fastens the two together with wax and invests them. There is a little piece of platinum carried in there as a guide or leader, and a small

piece of solder unites the pure gold to the cap, and if it has been crowned so that the outside fits snugly to the cap, it is a very nice piece of work.

Dr. Meeker—In making a crown tooth the essential points are strength, ease and facility in doing the work. We do not want any more exertion than is necessary, for we grow old fast enough at the best. I think the principles of strength of the work and ease in doing it are fully illustrated in the Logan and Bonwill crowns, more especially the Logan crown.

Another point is the preservation of the root, because you have nothing going under the margin of the gum, and if we grind away the root, when the crown is driven to place the cement will core through. I have made gold and porcelain crowns, and spent much time on them, but I find I can make eight or ten dollars easier and quicker by using this crown, and it gives just as good satisfaction.

Dr. Stockton—I am very much interested in this presentation to-night, and I hope very much from it. At our last meeting Dr. Genese, of Baltimore, spoke about and presented pivot teeth constructed on a principle just the reverse of this, having a counter-sink instead of a bevel, and they have been in use for ten years at least. It has been very satisfactory, but I think this an easier and better way of putting a pivot tooth on. The objectionable point, as has been stated here to-night, is that in nine cases out of ten, the band does not fit the root. Nothing of that kind can occur in a tooth made like this one; everything is free and clear, almost like a natural tooth, and I think they are certainly preferable. In answer to Dr. Osmon's question, I certainly think, from a layman's point of view, that this method of attachment would not infringe the bridge patent, because that distinctly describes a band around the root.

Dr. Osmon—I have noticed that with banded crowns there is always more or less inflammation around the gums after a time. I have seen them from the hands of men who are splendid workmen, the mechanical part being beautifully done, but in almost every case there has been more or less inflammation around the gum.

Dr. Stockton—I do not know just how many years it is since a number of you came to my house to see Dr. Richmond put on these

crowns. On Saturday last the gentleman for whom these crowns were inserted was in my office. I have reset the right central; the left central is just as Dr. Richmond put it on, but the gum has receded so that the root shows all around the band. It looks very badly indeed, and the crown will have to be replaced. I think that very often there is recession of the gum when bands are used.

Dr. Baldwin—Would not that occur in any tooth that had been crowned, or in a great many cases of pulpless teeth? •

Dr. Stockton—I think the band impinges upon the peridental membrane and drives it up.

Dr. Meeker—If you destroy the peridental membrane I do not see how the gum can be prevented from receding.

Dr. Baldwin—The points to be looked to in crown work are, to get the work as true to nature as possible, to do it as easily as possible, and have it as firm and serviceable as possible. I believe an all-porcelain crown is the most true to nature of any, and I think you will agree with me that a banded crown is the firmest and best. I think you will also admit that the striking up of a crown in one piece is the easiest and best way to make a crown. In that case no soldering is necessary. That method of crowning, as you will recollect, has been described in the American system of dentistry, as Dr. Evans does it, only he applies it to another tooth.

One important point in this connection has been overlooked, and that is that in porcelain and gold crowns the secretions of the mouth penetrate between the porcelain and the gold, and after a time it becomes offensive. In the union of the Logan crown, the phosphate of zinc being above as well as below, the action of the secretions of the mouth is prevented. If we can fit a crown to a root so that there will be a film of phosphate between them to preserve the root, we surely can fit a band in the same manner, and if it should not be accurately fitted, that little film of phosphate that does the work in the other case will certainly serve for the band.

Dr. Luckey—My experience has been that the easiest to make and the strongest crown is the one inserted on the same principle that has been described in the paper, trimming away the root and hollowing out the crown so that the cement is thickest and firmest at that point, the root being cut out so that it makes a cup shape.

On motion, the subject was passed.

NEW YORK ODONTOLOGICAL SOCIETY.

REPORTED FOR THE INDEPENDENT PRACTITIONER.

A regular meeting of this Society was held Tuesday evening, February 14th, in the parlors of the New York Academy of Medicine. The President, Dr. J. Morgan Howe, occupied the chair.

Dr. S. G. Perry exhibited a light condenser for illuminating the mouth, in the form of a brass upright rod with right-angle arm, so constructed as to slide up and down the shaft and fastened at any point by a set screw. At the end of the right-angle or arm is attached a large lens, which by ingeniously contrived joints may be placed at any desired angle. The apparatus he uses is made as an attachment to the S. S. White chair, and is placed on the left side. It is arranged to swing clear of the patient's head. He finds it of great service on dark days in condensing rays of light for operations in the mouth; it also does excellent duty when used in connection with gas light. The apparatus may remain a fixture to the chair, or can easily be unscrewed from the arm if so desired. He has his condenser brought to him by his assistant every afternoon as soon as the light begins to fail, and fixes it to the chair.

Dr. Z. T. Sailer described his method of setting crowns. He lines a plate tooth with a gold backing, to which is soldered a gold pin or wire. The pin is split, or sawed through lengthwise. A platinum flanged tube or box is fitted to the root-canal and made secure by a filling. The split pin is warmed and coated with gutta-percha stopping, then pressed into the tube. Teeth engrafted in this manner are secure, and can be removed, if necessary, with no great difficulty.

Dr. J. Foster Flagg, of Philadelphia, gave to the meeting a lengthy and very interesting talk on "The Claims of Gutta-Percha as a Tooth-filling Material, with Methods of Manufacture, Testing, Heating and Manipulation." Before entering upon his subject he took occasion to make an exceedingly complimentary reference to the New York Odontological Society, which he considers the most prominent and influential local dental society in the country. Although not numbering so many resident members as do some others, he recognizes the fact that it is composed of gentlemen

eminent in the profession, who have honored their calling and done much for its advancement. He felt it to be a great honor to himself to be invited to address so respectable a body.

Prof. Flagg then exhibited several pieces of crude gutta-percha as obtained from the manufacturers, and called the attention of the members to the great difference of seemingly like pieces. He offered for examination two of these pieces of equal thickness, one being considerably wider than the other, and requested the gentlemen inspecting them to compare the strips and give opinions regarding their flexibility, etc. Replies were given, that the narrowest piece appeared to be much stronger or tougher than the wider one. The reason for this difference, as explained by the doctor, is that even where several lots of gutta-percha were made from the same batch of gum and by the same process, the same results would not always follow. He was informed by the foreman of the works where he procured his crude gutta-percha, that when a quantity of gum was made up and rolled out there would appear several grades of the material. Some would be excellent, some not so good, and some exceedingly poor; consequently, great care should be exercised in selecting and preparing the gutta-percha for a tooth stopping. When fortunate enough to obtain a good quality of gutta-percha in any quantity, it should be kept in salt water, as the crude gum will deteriorate unless made into stoppings; but if thus made up it will remain without change for an indefinite period.

Samples of many preparations of gutta-percha were shown in the form of stoppings packed in glass vials, with carmine ink added, and all were found to leak. Dr. Flagg said that the pink base-plate gutta-percha, though exceedingly tough, leaked more than any of the other preparations. He thought it was not possible to make a filling of any form of gutta-percha that was proof against leakage. A friend had suggested varnishing the inside of the tube or vial with gutta-percha dissolved in chloroform, before introducing the filling. This he tried, and on being subjected to the same test it was found to leak in a few minutes. Stoppings were also carefully packed in little ivory cups, and after being tested with the ink were sawed in two, when the same results were observed. The products from the best manufacturers, although not absolutely proof against leakage, he thinks safe enough to protect the cavities from further decay.

A cavity in a large wooden tooth was filled by Dr. Flagg and passed around the room for inspection. It certainly presented a strong, hard filling. He prefers and uses serrated points for packing the gutta-percha, much like the large instruments used some years ago for condensing gold fillings. He objects to the practice so common with many operators of passing the stopping into or over the direct flame of the lamp, for it does not get uniformly heated in this way, the outside being over-heated while the centre is sometimes hardly warm. He instanced as an example a slice of bread held over a hot fire, which might be much scorched on the surface while the centre was not even crisp. No good or uniform filling can be made by this mode of heating. Just as much care is required in filling with gutta-percha as with gold. The rubber-dam should be adjusted to exclude any possibility of moisture, and the cavity carefully prepared or treated. Small bits of the stopping, after being properly heated, should be packed piece by piece with as much care as though using gold.

Replying to an inquiry as to his method of finishing gutta-percha fillings, Dr. Flagg stated that he used heated instruments for this purpose. He objected to the practice of wiping the stoppings with cotton saturated with chloroform, as it tended to soften the surface. He stated that many gutta-percha stoppings failed after being in the mouth for a time, from what he demonstrated "heat or mouth rot." In these cases the fillings seem to disintegrate.

Many dentists regard gutta-percha stoppings as more temporary fillings, yet consider gold as permanent. He asked what proportion of cases were to be seen where gold fillings, after having been in the mouth three, five, or eight years, were not in such a condition that the point or edge of a burnisher could not be introduced around the margin. And when such fillings are removed, much tooth structure must be sacrificed before other fillings can be put in; gutta-percha fillings, though they may wear away somewhat, or "cup out," preserve the integrity of the tooth structure and can easily be replaced. These then should more justly be considered "permanent." Dr. Flagg being interrogated regarding copper amalgams, stated that where teeth were badly broken away or riddled with cavities and could be filled with nothing else, he thought copper amalgam would do good service.

On motion, the thanks of the society were tendered the *speaker*.

Editorial.

ANÆSTHESIA AND ANÆSTHETICS.

We have received many letters from subscribers asking for an article, or a series of articles, upon anæsthetics and their mode of administration, to be written for the benefit of those who have had no special schooling in this branch of practice—plain, practical, and with as few technicalities as possible. We have determined to comply with these requests to the best of our ability, and to present our ideas as opportunity offers. It should be premised that, although we must speak didactically, we do not pretend to be authoritative, and what we say must be taken for what it is worth. Some years since we made a considerable study of the subject, and performed many experiments upon the lower animals, and it is upon this series of observations that we shall speak, drawing conclusions from our own studies, rather than from the writings of others. We shall not pretend to follow the usually accepted authorities, and if we antagonize them our readers must judge between us. Only do not let it be thought that we despise or undervalue the wisdom of the many who have written upon the subject. We simply prefer to express our own opinions, even though they may be crude and illogical, rather than to attempt to repeat what has been better expressed before.

To comprehend the effects of any drug upon nervous tissues, and what, for want of a better term, we may call the nervous currents, it is necessary that we enquire a little into the character of nervous force. In a paper read before the American Dental Association, at its meeting in Cincinnati in 1882, we gave our views at length, and we would like to refer the reader to the transactions of the society for that year for a full exposition of what we believe to be the origin and character of nervous force. At present we will only attempt briefly to summarize our views. For a full comprehension of the matter the student should be acquainted with the later theories concerning the nature of force, and to this end he should read “The Correlation and Conservation of Forces,” by Profs. Grove, Helmholtz and Liebig, and Drs. Faraday, Mayer and Carpenter, edited by Prof. Youmans and published by D. Appleton & Co., New York. Some of the views therein expressed have been

modified by later observations, but the book in the main stands as the best and most consistent system of the philosophy of force which has been presented.

All the different manifestations of force are mutually convertible the one into the other, and are practically a unit. Heat, light, electricity, and what is denominated chemical activity, are but the different modes by which force is manifested. Commencing with the simple battery cell, we see the chemical activity there exhibited made manifest as electricity. If a closed circuit be made by means of conducting wires in which a piece of thin platinum is inserted, the electric current is changed in character, and is manifested as heat. There is no change, save in the manner of its exhibition, but the invisible manifestation of the current is now made sensible to the eye, and we give it another name. It is the same force, but it has assumed a new form. If there be a total break in the circuit instead of a mere resistance, the same electricity is made manifest in yet another manner, and we call it light.

Here we have four different forms under which the same force appears, each mutually resolvable into the other, for heat and light may in turn induce an electric current or chemical action. We are then warranted in pronouncing them essentially identical, differing only in their mode of manifestation. The great error in the earlier philosophies arose from considering them as entities, each distinct from the other, and hence come the terms "positive" and "negative" electricity; "sensible" and "latent" heat, etc. We must take care to avoid this mistake and to look upon them as simply manifestations of an imponderable force, which is the active agent in producing all the changes in passive matter. We have no knowledge in this world of anything but the inert matter which constitutes all created things, and the mysterious force which is only made sensible by its action upon matter.

Pursuing this train of reasoning, and looking at the matter from a purely physiological and material standpoint, and without any reference to a spiritual or immaterial principle which may form another part of our existence, we are able to view our bodies as composed of inert matter, which is made physically active by some exhibition of the unit force. This physiological activity, this manifestation of force, is, we believe, but another exhibition of that great force which acts upon all matter, and it is demonstrated

nervous force. As by the molecular changes within the battery cell, under the influence of chemical affinity, we see an evolution of that form of force which we call electricity, so within the active animal body the molecular changes which take place under the influence of what we call digestion, result in the evolution of nervous force.

Nor does this manifestation essentially differ in character from the other forms of the unit force. It is at times made manifest as heat, and even as electricity. Light, heat and electricity are, under certain circumstances, converted into nervous force, and *vice versa*. I might cite a great many instances of this, but the thoughtful student of physiology will readily recall them. Many of the diseases to which we are subject are due to the mysterious conversion of nerve force into heat, etc. There is an order of fishes which, by peculiar nervous organs, has the power at will to change nerve force into electricity, and there are insects which convert it into light, in the same manner.

We shall then consider nerve or vital force as essentially identical with the other manifestations of force, and nervous and ganglionic tissue as that whose peculiar office it is to convert other forms of force into nervous force, and to convey or conduct its undulations or influence to the different organs, or aggregations of animal matter.

(TO BE CONTINUED.)

EDITORIAL NOTICES.

An esteemed friend asks us whether the notices of appliances, remedies, etc., which he sees in this journal, are purchased "puffs" or the expression of an honest and unbiased opinion. There is a sting in the query, although we are fully convinced that the writer intended no intimation that we were purchasable. It is such a common occurrence for journals to promise and to give to all advertisers "reading notices," usually prepared by the advertisers themselves, that we do not wonder that our friend may fear that we have fallen into the evil practice.

Five years ago the publishers of this journal gave notice that no advertisement would be accepted which they have not cause for believing worthy the attention of honest men. They have tried to

live up to that rule, and there has scarce been a month since in which they have not declined to admit advertisements of articles or firms that they could not conscientiously commend. In one case a page advertisement, for which a profitable contract had been made, was inserted three months before it was discovered that we had been imposed upon by false representations, yet it was at once removed and the amount forfeited, although by allowing it to stand for another month we might have received a considerable sum of money upon the contract. If among our advertisers there is a single firm that is not entirely reliable, or an article recommended that is not worthy of patronage, and the fact be demonstrated, that objectionable advertisement will be at once removed.

When the present editor assumed control of the *INDEPENDENT PRACTITIONER*, he announced that he would examine and make a practical test of any appliance or material that might be sent him, and if he believed it worthy he would give it notice in the journal. But this was upon condition that anything of material value, after it had been tested, would be returned to the sender at his expense, unless he desired it to remain on exhibition for his own benefit. This condition was insisted upon lest it might be thought that our opinion was unduly biased by a valuable present. The reasons for offering to examine and report upon new appliances, either personally or at the hands of one of our associates, were that many easily constructed little conveniences are devised by practitioners, and if they were described and commended when worthy it might assist many of our readers.

Again, it is well known that unprincipled men have patented devices which had originated with others, and in many instances dentists have been called upon to pay royalties upon some appliance which they had themselves originally conceived. By making a permanent record of their inventions this pirating would be effectually prevented. There is no doubt that had this course been pursued in the past, dentists would not now be subjected to the exactions of some greedy patentees. In this number four or five little conveniences are mentioned, either of which might be made by any dentist, and their pecuniary value is but a very few cents. Yet they are more gladly given space than they would be if they represented dollars, for they are mentioned in the sole interest of our readers.

No article or remedy has been or will be commended which some one of the publishers of this journal has not personally tested and approved. No manufacturing or mercantile firm has been or will be mentioned of whose entire reliability we are not fully assured. No person has yet had the hardihood to insult us by offering any valuable consideration for a favorable notice. Should any do so, they will be most emphatically convinced that our opinions are not in the market, and that if any scoundrel attempts to purchase the commendation of this journal it knows how properly to resent the affront.

We cannot expect every one to agree with us as to the value of an appliance or book, for what would be useful to one, another might pronounce worthless. Our opinions may not be of any particular importance, but they shall at least possess the merit of being honest convictions.

WELDING OF GOLD.

A valued correspondent propounds a series of questions of which the following is a summary :

“What would be the difference in unit pounds—if any—necessary to a perfect weld of two pieces of soft iron at a white heat, between strikes of a hammer and ponderous pressure without concussion?”

The queries refer to the rotary *versus* the mallet system of filling teeth, and the natural inference to be drawn from them is, that as iron welds more readily and perfectly under blows from a hammer than from mere pressure, the same rule will hold good in consolidating a gold filling. We cannot think that the instances are parallel. Our correspondent confounds ready cohesion with the ordinary process of welding. When two cohesive surfaces are brought into absolute contact, they unite without either pressure or a blow. If two pieces of soft wax are brought together, they cohere at once. If two pieces of iron are heated almost to the melting point, their particles unite upon being brought together, because cohesion is nearly destroyed and the particles intermingle, as in the case of colloids, and then recrystallize. But iron at a lower temperature is not cohesive, and it is with great difficulty that the molecules of two different pieces are made to unite.

This is not the case with gold—at least not to the same degree. If two surfaces of perfectly pure gold, made entirely clean, are put in absolute contact, they at once cohere, and no blow is necessary for their union. Theoretically then, gold should be easily welded by mere pressing or rubbing the surfaces together. But practically it is very difficult to obtain gold that is in the proper condition. It is almost impossible to keep foil absolutely clean. There will be a film deposited upon its surface, from the atmosphere or from the leaves of the book in which it is contained, and this will be fatal to ready coherence. A blow upon a serrated plugger will cause an interlacing of the particles, and will break up the film upon the surface and thus bring the particles into immediate contact, allowing them to unite at once. If we heat the gold we drive off this film, and it becomes "cohesive" or "adhesive," but the pieces now unite so readily that "bridging" is liable to occur. To our apprehension, the gold that is in a fit condition to readily unite under the rotary system is impracticable on this account, and hence we choose that which is less clean, and "soft" enough to permit the sliding of one surface upon another, and then resort to the mallet to secure the necessary consolidation.

CARBOLIC ACID AS AN OBSTUNDENT.

How many dentists are in the habit of employing carbolic acid for the purpose of overcoming the sensitiveness of a dental pulp, or that of the nerve canal? And yet we believe it the best agent for that purpose which is known to the dental pharmacopoeia. A pulp may be painlessly removed by its use if patience be exercised. The extreme sensitiveness that sometimes exists at the ulterior point of a canal may be entirely removed if a little time and care are used in working the agent to the sensitive point. The rubber-dam must of course be first applied, and then a delicate broach, which is frequently dipped in the carbolic acid, should be carefully worked into the cavity, and gradually advanced as the obtunding process goes on. If the cavity or canal be large enough, a film or two of cotton may be wound around the broach. The best instruments for this purpose that we have ever used are the Donaldson broaches, and canal cleaners. If one of the latter can be employed, it will, simultaneously with carrying the carbolic acid to place, remove all of the obtunded pulp.

A WARNING INSTANCE.

If every correspondent of this journal would take particular pains to write all names distinctly it would save some annoying mistakes. It is impossible to determine a proper name from its connection in the sentence, as may be the case with other words. How often have we been led to sympathize with poor, much-abused Belshazzar, of Biblical fame, whose knees smote together when he saw an illegible handwriting which it was essential that he should so construe that it would make sense. We have undergone about the same sensation under similar circumstances, and we were at a disadvantage, too, in having no sharp lawyer at hand who was skilled in interpreting the curious hieroglyphics of some correspondent who appeared to write with his finger rather than with a pen. Will not those who favor the INDEPENDENT PRACTITIONER use a degree of caution that will prevent such addling of editorial brains as may make it necessary to turn us also out to grass ?

BIBLIOGRAPHICAL.

IRREGULARITIES OF THE TEETH AND THEIR TREATMENT. By EUGENE S. TALBOT, M. D., D. D. S. With 152 illustrations. Philadelphia: P. Blakiston, Son & Co. 1888.

Dr. Talbot has, for some years, been known in the field of orthodontia as a man possessed of clear and well defined ideas respecting the origin of dental deformities, of extended experience and wide observation, as well as originality in devising appliances for the remedy of dental defects. This book is the summing up of the papers which he has at different times read before societies, and the results of his years of study. It forms a valuable addition to the literature of the subject, and no man will be enabled to boast of an acquaintance with it until he shall have mastered this book.

Yet the work is incomplete. The description of the appliances used is not sufficiently clear to enable the reader always to comprehend the method of their construction, nor are the principles involved sufficiently elaborated to constitute a full treatise. The author might plead that anyone who is sufficiently advanced in dental science to take up the study of irregularities should know the primary principles of mechanics, and it should be unnecessary to descend to detail. Yet the same argument would have deterred him from inserting an elementary chapter on anatomy, which con-

tains the same cuts that are made to do duty for too many books of widely divergent character.

If the whole of the work had been devoted to an exposition of the methods and devices of Dr. Talbot himself, we think that it would have been more satisfactory, and the space would have been none too great. But when within its 100 pages the anatomy of the mouth is considered, and the systems of Patrick, Farrar, Guilford and others are included, it may readily be imagined that the presentation is too much condensed for entire perspicuity. Less than two pages, for instance, are devoted to Dr. Patrick's methods, which are barely sufficient to give them a brief notice. Dr. Angle is not mentioned at all, and hence we think it would have been better had the whole space been devoted to a consideration of the views and methods of Dr. Talbot himself. When the second edition shall be called for we shall look to see it considerably enlarged, or materially restricted in its scope.

PHOTOGRAPHIC ILLUSTRATIONS OF SKIN DISEASES. A complete work on Dermatology. By GEORGE HENRY FOX, A. M., M. D. Complete in twelve parts, with ninety illustrations from life, with hand colored plates. New York: E. B. Treat, 771 Broadway, 1888.

The second edition of this magnificent work is now in course of publication by E. B. Treat. When the first edition was issued, eight years ago, it marked an era in the illustration of pathological conditions, and established the value of photography, especially in delineating skin diseases. That edition met with such favor as works of the kind seldom receive, editions being published in France and Germany. This second edition is not a simple reproduction of the first, but is an entire remodeling of the work, with the text doubled in amount. The plates are from the original photographs, reproduced by Mr. Edward Bierstadt, by means of the unfading artotype process. The hand coloring has been done by Dr. Joseph Gaertner, a well-known medical artist, who was formerly a student under Von Hebra, in Vienna. The work is issued in the very highest style of the printing art, in the form of an atlas, the plates, on heavy cardboard ten by twelve inches in size, being inserted in the text.

From this imperfect description it may well be imagined that this is one of the most magnificent works on Dermatology ever issued.

It is something more than a medical book; it is a work of art as well. It is issued in twelve monthly parts, each part consisting of four plates, comprising from six to ten cases, at \$2.00 per part. Parts I, II, III and IV are now ready, and may be obtained by addressing the publisher.

FEVER NURSING. Designed for the use of Professional and Other Nurses, and Especially as a Text Book for Nurses in Training. By J. C. WILSON, A. M., M. D. Philadelphia: J. B. Lippincott Company. 1888. Price, \$1.00.

This is one of a series of hand-books issued from the well-known press of Lippincott, and intended as text books in the training schools for nurses, which have been established in connection with most of the great hospitals. It is made up from the lectures of the author before the class in the Philadelphia Hospital, and contains plain instructions in the duties of the nurse from the standpoint of the physician. But while it was primarily intended to supply a definite want, its usefulness will not by any means be restricted to that field. The practicing physician will find very much that will be instructive in one of his most important duties, the supervision of the care which his patient is to receive. Mothers, too, would do well to study it, for there are few whom it would not greatly benefit. In fact, all to whom the care of the sick is ever committed, whether professional or otherwise, should carefully note its recommendations and become familiar with its excellent teachings.

DENTAL METALLURGY. A Manual for the use of Dental Students. By CHAS. J. ESSIG, M. D., D. D. S. Second edition, revised. Philadelphia: The S. S. White Dental Manufacturing Co. 1888.

The first edition of this work was issued only about five years ago, and the fact that a second is so soon demanded speaks more in its favor than will the voice of the loudest of the critics. It has met the approval of dentists everywhere, and has been widely adopted as a text-book in dental schools. It is not a treatise—it is but a handbook—but it contains a great deal of information within a small compass.

The second edition is not merely a reprint of the first. The work has been revised, somewhat enlarged, and brought down to the present date, so that it is complete, so far as its scope will permit. We need not say that it is neatly printed and bound. The reputation of the publishers is a sufficient guarantee for that..

BELCHER'S DENTAL DIRECTORY OF THE UNITED STATES. New York: Beecher & Co., 42 Third Avenue. 1888.

This handsome volume purports to be a complete directory of all the dentists of America. It contains, in addition, a complete list of all the leading dealers in and manufacturers of dental supplies, of dental colleges, dental publishers, etc. If its accuracy could be relied upon it is an invaluable publication, but we notice numerous errors which greatly mar its usefulness.

SIX HUNDRED MEDICAL DENTS; or the Physician's Utility Enhanced. By FERD. C. VALENTINE, M. D. New York: G. W. Dillingham. 1887.

We will add the Six Hundred and First "Dent," and it will be—Don't spend much time in the study of such silly trash as that which comprises the greater part of this book.

Die Ueberzahl und Unterzahl in den Zähnen des menschlichen Gebisses mit Einschluss der sogenannten Dentitio tertia.

(Excess and Deficiency in the number of teeth in the Human Race, including the so-called third Dentition.) By Prof. Dr. Busch. Berlin.

Removal of Solid Uterine and Ovarian Tumors by Laparotomy; with a report of nine cases. By MATTHEW D. MANN, A. M., M. D. Reprinted from *The American Journal of Obstetrics and Diseases of Women and Children*.

Footprints of a Profession, or Ethics in Materials and Methods. Address delivered before the Maine Dental Society at its twenty-second annual meeting. By HORATIO C. MERRIAM, D. M. D.

Operations for Mastoid Diseases. Statistical Report of 3,700 Cases of Ear Diseases. Treatment of Chronic Suppurative Otitis Media. By SETH S. BISHOP, M. D.

Nasal Stenosis. Its effect on the eye, ear, pharynx, larynx, voice and brain. By C. A. BUCKLIN, A. M., M. D. Reprinted from the *New York Medical Times*.

A Series of Twenty-Five Laparatomies. By MATTHEW D. MANN, A. M., M. D. Reprinted from *The Medical Press of Western New York*.

Supra-Pubic Lithotomy. A Historical Sketch. By CHARLES W. DULLES, M. D. Reprinted from the Trans. Medical Society of Pennsylvania for 1887.

Current News and Opinion.**CORRESPONDENCE.**

The following is presented as a model for querists. It is comprehensive, definite, and what is of more importance, it is brief. As it was evidently suggested by the report of the December meeting of the Central Dental Association of Northern New Jersey, it was submitted to the essayist of that meeting, and his most pronounced critic, for equally terse answers, which follow it. Of course, circumstances largely govern the course to be pursued. A case at present under our care will illustrate this. It is that of a child of eleven, the symmetry of whose unusually fair face is marred by unequal development of the maxillæ. The lower, which is too prominent for the upper, contains sound first molars. The upper corresponding teeth are very badly decayed, yet their extraction would intensify the partial disfigurement, and hence we think good practice demands that they should be retained at almost any hazard. Were the decayed teeth in the lower jaw, they would be unhesitatingly extracted.

EDITOR.

Editor Independent Practitioner:

SIR:—We have had quite a number of articles in the journals recently on "Extraction of the First Molar." Suppose the patient is eleven or twelve years old, the second molar has *not* erupted, the first molar has a dead pulp, or, perhaps, is abscessed, and is sound except one cavity leading into the pulp chamber. Would you treat and fill, or extract it and trust to the coming forward of the second molar to take the place of the first? Is it advisable to have a pulpless tooth in so young a patient? By answering the above in your next issue you will oblige,

J. H. PARSONS, D. D. S.

BOULDER, Colorado, Feb. 8, 1888.

ANSWER OF DR. WELD.

In the first place, a sixth year molar, such as is described, pre-supposes a condition of things which would seem to call for extraction; such a tooth abscessed is not generally sound with the exception of "one cavity." The principle which involves the preservation of any tooth is sometimes lost sight of in exceptional cases, where judgment is necessary, and one cannot very well decide without first seeing the patient. I know of no good reason why a pulpless tooth, properly treated, should not be allowed to remain in the mouth of so young a patient.

G. W. WELD.

ANSWER OF DR. TENISON.

I cannot answer Dr. Parson's questions intelligently without knowing the conditions of the other teeth, but will say it is not advisable to have a pulpless tooth, especially when it is abscessed, in so young a person's jaw, if it can be avoided. The extraction must rest with his judgment. When I find it necessary to extract one sixth year molar I extract all four, provided both jaws are normal.

W. D. TENISON.

Editor Independent Practitioner:

In your January number, Prof. Pierce makes objection to the remarks which I made at a meeting of American dentists in Coblenz, and asks for names, dates, etc. Prof. Pierce will find by consulting the same number of your journal that a slight mistake was made in the report, and that my remarks were not such as call for names. I have no intention of publishing names of graduates from any college, who ought not to be in possession of the D. D. S., and that for reasons which must be apparent to every one.

If, however, Prof. Pierce wishes it, I will be glad to substantiate my remarks if you will lend the columns of your journal to this purpose.

In answer to the other questions of Prof. Pierce, I respond that by the "Pennsylvania School" I mean the Pennsylvania College of Dental Surgery, and I consider that a college gives a diploma improperly, or to an unworthy person, when it grants the same to anyone whose general or special education is below that which we have a right to demand, and which is universally expected from a person who holds the title of doctor in a specialty of medicine or surgery.

W. D. MILLER.

BERLIN, Feb. 2, 1888.

A NEW AND SIMPLE MATRIX.

Dr. Samuel E. Freeman, of Chicago, sends us samples of a very simple matrix to be used in filling teeth, which he makes as they are wanted for each particular case. The material is "Taggart's" or "Taggart's" tin, which is the ordinary sheet tin, but of about 36 gauge, very flexible and soft. It is used by the manufacturers of tin cans for sealing after the tin is filled, as it is readily cut open with a knife. A piece cut to the proper width is folded down at one end with flat nosed pliers so as to make it double, when it presents about the appearance of the outline of this diagram. With shears it



is now cut, following the dotted lines, which it will be seen do not run entirely around the folded edge, enough being left to form a hinge for the two parts. It is placed in position, a wedge driven between the two leaves and the points bent and lapped against and around the teeth. As the tin presents a highly polished surface, it so reflects the light as to illuminate the cavity.

Of course the size, and to some extent the shape, will be dictated by the size of the tooth and cavity. It is a matrix that can be readily used in filling front teeth, and as it practically costs nothing and is made in a moment, it need not be used a second time. It is certainly a very ingenious and effective appliance.

A NEW ANÆSTHETIC.

Prof. Dr. Lewin, of Berlin, has made some experiments with a new alkaloid, Erythrolein, with which the inhabitants of the western coast of Africa poison their arrows. Two Cgms. (about one-sixth of a grain) were sufficient to destroy a dog. Rabbits required less. A two per cent. solution of this alkaloid, when applied to the eye of a cat, after fifteen to twenty minutes produced complete

insensibility, lasting from one to two and a half days, without injury to the eye. Fifteen minutes after a hypodermic injection of this alkaloid into the back of a guinea-pig, Dr. L. was able to cut through the muscles of the back without the animal exhibiting any signs of pain. Under the influence of large doses the animals died in convulsions, but smaller doses will produce any degree of anaesthesia required. Probably the profession may find this substance of great value in obtunding sensitive dentine — *Zahnärztliches Wochenblatt*, Jan. 21.

CHICAGO DENTAL CLUB.

The annual meeting of the Chicago Dental Club took place at the Tremont House, Jan. 23, 1888. The report of the Secretary showed an active membership of thirty-eight, an increase within the year of thirteen, with applications pending which in the near future will increase the membership to fifty. The dues of this club are but one dollar per annum, and it is desired to make it a practical working society, free from unprofitable or useless consumption of time. Two clinics have been given, at which many valuable operations and appliances were exhibited. The following officers were elected for the ensuing year:

President—Arthur B. Freeman

Vice-President—J. Austin Dunn.

Secretary—C. Stoddard Smith.

Treasurer—E. M. S. Fernandez.

Member Business Committee—W. G. Stowell.

The regular meetings are held on the fourth Monday in each month, at the Tremont House.

C. STODDARD SMITH, Secretary.

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

The regular annual meeting was held on Monday evening, Feb 20th. The following were elected officers for the ensuing year:

President—Geo. E. Adams, South Orange.

Vice-President—Oscar Adelberg, Elizabeth.

Secretary—J. Allen Osmun, Newark.

Treasurer—Chas. A. Meeker, Newark.

Executive Committee—S. C. G. Watkins, Montclair; B. F. Luckey, Paterson; C. S. Stockton, Newark; C. F. Holbrook, Newark; W. P. Richards, Orange.

ILLINOIS STATE DENTAL SOCIETY.

The twenty-fourth annual meeting of the Illinois State Dental Society will be held at Cairo, beginning Tuesday, May 8th, and continuing four days. This point has been selected because convenient for the dentists of southern Illinois, with the hope that many who have not hitherto met with us will do so this year; also for the further reason that it is of easy access to those living in other States, south, east and west, to all of whom a cordial invitation is extended. An excellent programme has been arranged, with clinics as a special feature.

C. B. ROHLAND, President.

GARRETT NEWKIRK, Secretary.

MARK TWAIN SAYS many wise as well as humorous things. Here is one: "She was one of those people who are infatuated with patent medicines and all new-fangled methods of producing health or mending it. She was an inveterate experimenter in these things. When something fresh in this line came out she was in a fever, right away, to try it, not on herself, for she was never ailing, but on anybody else that came handy. She was a subscriber to all the 'Health' periodicals and phrenological tracts, and the solemn ignorance they were inflated with was breath to her nostrils. All the 'red' they contained about ventilation, and how to go to bed, and how to get up, and what to eat, and what to drink, and how much exercise to take, and what frame of mind to keep one's self in, and what sort of clothing to wear, was all gospel to her, and she never observed that her health journals of the current month customarily upset everything they had recommended the month before. She was as simple-hearted and honest as the day was long, and so she was an easy victim. She gathered together her quack periodicals and her quack medicines and then armed with death, went about on her pale horse, metaphorically speaking, with 'hell following after.' But she never suspected that she was not an angel of healing and the balm of Gilead in disguise to the suffering neighbors."

A MEDICAL SUMMARY correspondent says: "Nine persons out of every ten with a cinder or any foreign substance in the eye, will instantly rub the eye with one hand while hunting for the handkerchief with the other. They may, and sometimes do, remove the offending cinder, but more frequently they rub until the eye becomes inflamed, bind a handkerchief about the head and go to bed. This is all wrong. The better way is not to rub the eye with the cinder in it at all, but rub the other eye as vigorously as you like."

Certainly the rubbing of an eye with a cinder in it will do nothing more than to rub it in, while to rub the well eye may, through the well-known sympathetic action, cause such a muscular agitation and flow of the secretions as will spontaneously remove the cinder.

A MEDICAL WORLD correspondent says that the following lotion will preserve the skin from the effects of cold, prevent chaps and render the hands soft, white and smooth. It is to be used on the hands every night before going to bed, and in cold weather is to be applied before going out into the open air, the hands first being washed and dried:

R

Oil Rose,	℥ss.
Glycerine,	℥i.
Sp. Myrtol,	℥ss.
Oil. Cajaput,	℥ss.

CHLOROFORM AND ETHER are both antagonistic to cocaine, and the inhalation of either will allay the convulsions due to a poisonous dose of the latter. On the other hand, cocaine may be used as an antidote in cases of poisoning by narcotic agents, especially such as cause great depression of the respiratory and cardiac centres.

DR. FRANK B. DARBY, of Elmira, sends us specimens of stiffened paper points for drying pulp canals which are very useful. The first root which we had prepared for filling after their reception was tested with one of them, and to our surprise we found moisture at the extreme end, which was effectually removed by the points. Yet we had believed it quite dry, for the hot air syringe and other appliances had been, we thought, faithfully employed. A useful lesson was taught, and the possible cause of occasional pericemental irritations subsequent to root-filling revealed.

Dr. Darby's hard felt polishers with shellac centers, for the dental engine, will also be found exceedingly effectual in the polishing of fillings.

M. DEFONTAINE, doctor in chief to the Creusot electric forges, in a paper read before the French Society of Surgeons describes the symptoms of a kind of sun-stroke to which the workmen are liable, from the intense light of more than 100,000 candle power from a few square centimeters of surface. The skin changes to a reddish brown sometimes, after two or three hours' work, and subsequently peels off. There are pains in the cheeks, neck and forehead, and notwithstanding the use of colored glasses, there is a flow of tears for twenty-four hours, the victims are blind to objects in common daylight for some minutes, and perfect vision is not restored for hours.

DR. LENOX BROWN says that in extirpation of the larynx, one-third of the patients die in a few days, one-third in a few months, and none live longer than thirteen or eighteen months.—*American Lancet*.

In the number of this journal for August, 1885, we gave an account of a case of total extirpation of the larynx by Prof. Roswell Park, of the University of Buffalo. The patient, a physician of sixty, is alive and quite well to this day, two years and eight months after the operation. We believe it to be true, however, that a large proportion of patients on whom this operation has been performed have died within a short time.

DR. A. P. SOUTHWICK, of Buffalo, was appointed by the Governor a member of the commission to investigate and report the most humane and practical method of carrying into effect the sentence of death in capital cases. That commission has made its report to the legislature, and recommends the substitution of death by an electric shock for that by hanging. That portion which presents the practical reasons for the change was prepared by Dr. Southwick, and his argument is certainly a strong one, and well worth a careful study, whatever may be the predilections of the reader for the old-fashioned neck-stretching of hardened criminals.

ALBANY MEDICAL ANNALS celebrates the new year and the commencement of its ninth volume by changing its size, its form and its management. Formerly it was published as the Organ of the Albany County Medical Society. Henceforth it will have a broader field, and be emphatically a journal of medicine. We shall look for its appearance in the future with even more of interest than in the past.

READERS OF THIS JOURNAL who have occasion to use, or to recommend to their friends or patients, an emulsion of Cod Liver Oil, should not fail to try that which is prepared by the Charles H. Phillips Chemical Co., whose advertisement appears on the second cover page of the *INDEPENDENT PRACTITIONER*. It is a perfect emulsion of the finest quality of Cod Liver Oil, and the latter is so completely digested that even the microscope will show only the most minute globules. It mixes with water as perfectly as milk, is pleasant to the taste, and is readily assimilated. We have tested its merits and know something of its value.

F.

THE OHIO STATE JOURNAL OF DENTAL SCIENCE, for January, contains an excellent portrait of its editor, Dr. Geo. Wall, who is so widely known and respected in dentistry. *Items of Interest*, also, gives a counterfeited presentation of its editor in its January number. Both men are veterans, who have done good service in dentistry, each in his respective field. When the editor of this journal gets to be as good looking as his respected seniors, and has labored as long and successfully, the *INDEPENDENT PRACTITIONER* might have some excuse for presenting his picture.

THE UNEXPECTEDLY LARGE DEMAND for Prof. Stowell's *Atlas of Histology* in connection with subscriptions to the *INDEPENDENT PRACTITIONER*, entirely exhausted the first edition about the first of February, ult. A second was in process of preparation, but some unexpected delays occurred, so that it was not ready for delivery until about the fifteenth. This will account for the failure to receive the book promptly by some subscribers. It has now been forwarded to all who are entitled to it. If any have failed to receive it, they should notify our Buffalo office immediately.

CHICAGO has eleven medical colleges recognized by the State Board of Health. Among them is a school of dermatology. The number of professors exceeds a hundred. It is said that not a third of them receive any compensation for their work. When it is remembered that of lecturers, demonstrators and instructors there are half a hundred who receive no compensation, it will be seen that the medical professors in Chicago do not become bloated bondholders from their fees as teachers. —*American Lecturer*.

TO SUBSCRIBE for a live dental journal costs only four-and-a-quarter cents a week, or about three-quarters of a cent a day. Compare this insignificant sum with the amount of money paid for cigars, newspapers, and street car rides, ye who think you "cannot afford" to take a dental journal! What will pay a dentist better than to keep himself supplied with the leading periodicals which relate directly to his practice?

IN DENTISTRY, as in every other profession, we have men who take far more trouble to get friends and patients than to get knowledge. They live in a fever of unrest, unless every day brings its new acquaintances, but they are content with the experience of the past, and occasional scraps picked up by the way. —*Dr. Boers*.

FRANKLIN LEONARD POPE, an authority in electrical affairs, contributes to the March number of *Scribner's Magazine* a paper on the "Electric Motor and its Applications," which is a complete account in brief compass of the origin and development of the use of electricity as a motive power. It is fully illustrated. This is an article of special value to dentists, and is well worth the subscription price of a volume

SEABURY & JOHNSON supply antiseptic napkins of cotton flannel that are very convenient for dental use. They are about eight inches square, but may be readily cut to smaller sizes, and are useful, not only as substitutes for the ordinary mouth napkin, but for wiping instruments, and for numberless other dental purposes. As they cost but two dollars per hundred, they are thrown away when soiled.

THE EDITOR of this journal will pay a liberal price in cash for the following numbers of dental journals, or he will exchange others for them with any who have files which they wish to complete.

THE DENTAL REGISTER, Vol. III, Nos. 1, 2, 3. Vol VI, No. 1.

THE AMERICAN JOURNAL OF DENTAL SCIENCE—third series. Vol. VII, Nos. 7, 10. Vol. VIII, No. 7.

THE NEW YORK ODONTOLOGICAL SOCIETY seems to be having a series of meetings this season which are both interesting and instructive. We learn that the society is reviving its old enthusiasm, and that the Executive Committee have arranged with a number of gentlemen of well-known ability to be present at future meetings and read papers that cannot fail to be productive of interest to our specialty.

DR. MILLER'S ARTICLE, as published in the last number of this journal, contained a few errors, the correction of which in the proof did not appear in the text. The names of Professors Paetsch and Sauer were misspelled, and on page 72 the *Nervus trigeminus* was metamorphosed into "Nervous Trigemini," a change which might subject the author to the charge of bad scholarship.

CLAUDIUS ASH & SONS, of 30 East 14th Street, New York, have commenced the importation of the German Wolrab gold foil, and are prepared to furnish it to dentists in any quantity. No other gold has been found quite equal to this for the rotation method, while it is excellent for any use. Its virtues are, however, too well known to need comment.

THE WALTHAM EMERY WHEEL CO. are furnishing corundum wheels and points for dentists' use that are of a superior quality. We have tested them and find that they cut readily and easily, do not heat disagreeably, and last surprisingly. As they are intended to be used dry, they present advantages for operative work.

"THE IMPERIAL ALLOYS," advertised in this journal, on account of the death of Mr. Glover, will in future be known as "The Russell Alloys" "The rose by any other name would smell as sweet," and the character of the alloys is not altered by the change of name.

THE KANSAS STATE DENTAL SOCIETY meets at Topeka, the last Tuesday in April, 1888. Arrangements are in progress for a more than usually interesting meeting.

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The Independent Practitioner—Vol. IX.

PUBLISHED BY DENTISTS FOR DENTISTS.

Prospectus.

THE INDEPENDENT PRACTITIONER, from the commencement, has constantly increased in circulation and influence. We propose to make Vol. IX better than any of the previous volumes. For the purpose of bringing it more prominently before dentists, and at the same time to place in their hands one of the most valuable books of reference yet published, THE INDEPENDENT PRACTITIONER has made arrangements with Prof. C. H. Stowell, of Ann Arbor, Mich., which enables it to offer his "Microscopic Structure of a Human Tooth," in connection with subscriptions, at an unprecedentedly low rate. This magnificent work, which is published in the form of an atlas containing twelve plates, each twelve by sixteen and one-half inches in size, undoubtedly enables the student and practitioner to get a clearer and more comprehensive idea of the various tissues of the human tooth than can be obtained by any other means. The accompanying text fully explains the illustrations, and gives a concise and clear account of the histological structure of the human tooth. The plates are printed on heavy board, the paper and press-work are like those of some holiday annual, while the cover of the portfolio is in very beautiful imitation of alligator skin. The whole forms a handsome and very appropriate ornament for the office table. Any dentist who desires to obtain a clear and accurate idea of the appearance of the intimate dental tissues, or who desires to impart this information to others, should possess this work.

It was published at the moderate price of SIX DOLLARS, and Prof. Stowell assures us that after this announcement it will not be sold singly for less. We have made such arrangements that we can furnish it in connection with a subscription to **The Independent Practitioner for One Dollar and Fifty Cents.** That is, to every one who will send in **Four Dollars** we will send the **Independent Practitioner** one year and a copy of this beautiful and useful atlas.

This offer is intended only for subscribers in America. Foreign residents within the postal union must enclose fifty cents more for prepayment of postage upon the Journal. Our regular rate of subscription to such is three dollars per annum.

As the book absolutely costs more than the sum for which it will be furnished, the money must accompany the subscription. Nor will the book be sold separately. It will only be sent in connection with a subscription to this journal.

The book will be sent either by mail or express. If it is desired that it should be sent by mail, the postage (twenty-five cents) should be sent. All remittances should be made to the Editor, Dr. W. C. Barrett, No. 208 Franklin Street, Buffalo, N. Y. Postal Orders, Postal Notes, or New York Drafts are the safest and most convenient.

BARRETT, W. C. Buffalo.	CARR, WILLIAM,.... New York.	FRANCIS, C. E. New York.
BODECKER, C. F. W. N. Y.	DUDLEY, A. M. Salem, Mass.	HILL, O. E. Brooklyn.
MILLER, W. D. Berlin, Ger.	PALMER, S. B. Syracuse.	

THE Independent Practitioner.

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APRIL, 1888.

NO. 4.

NOTE.—No paper published or to be published in another journal will be accepted for this department. All papers must be in the hands of the Editor before the first day of the month preceding that in which they are expected to appear. Extra copies will be furnished to each contributor of an accepted original article, and reprints, in pamphlet form, may be had at the cost of the paper, press-work and binding, if ordered when the manuscript is forwarded. The Editor and Publishers are not responsible for the opinions expressed by contributors. The journal is issued promptly, on the first day of each month.

Original Communications.

CONTRIBUTIONS TO THE HISTORY OF DEVELOPMENT OF THE TEETH.

BY CARL HEITZMANN, M. D., AND C. F. W. BÖDECKER, D. D. S., M. D. S.

CONTINUED FROM PAGE 121.

Horace M. Hayden (American Journal of Dental Science, First Series, Vol. I, page 137.) (From the Medical Repository for 1813) was of opinion that a membrane, which he calls the semi-osseous stratum, analogous to that which lines the shell of an egg, was present between the enamel and the dentine, for the purpose of holding the two substances together. This author, at great length, quotes and criticises the assertions of Blake, which were first published in 1798 and 1801. Hayden questions the possibility of the formation of the enamel by the action of a membrane, especially as it (the

enamel organ) does not contain vessels which furnish it with red blood, and he, therefore, rather favors the theory of Hunter. He is of opinion the enamel is formed by the semi-osseous stratum, that the more subtile parts of the ossific matter of the tooth are infiltrated, strained off, or deposited, which, when crystallized, forms the enamel or cortex striatus. This author also denies that the cementum is formed by a membrane, and believes that there is proof positive of its being deposited only by the arteries that are distributed upon the membrane. He then speaks of caries of the dentine, and the reaction which, during this process, occurs in the pulp-chamber of a living tooth, which he also attributes to the action of the blood-vessels, and not to any kind of membrane. He entertains like views regarding the formation of the dentine.

Th. Schwann (*Microscopische Untersuchungen*, Berlin, 1839, page 117), after extracting the lime salts from the enamel of a foetal tooth, obtained an organic residue which, under the microscope, appeared like the forms of enamel prisms, and thus came to the conclusion that the enamel must be either an ossification of this organic substance, or the organic substance must be present in the pores of the enamel prisms. He gives a good description of the enamel cells, and observed that they arise from the round cells, as he noticed near the summit of the crown in a preparation these cells to be cylindrical, whereas, toward the neck they were round. He also mentions the occurrence of a peculiar substance present between the enamel membrane and the formed enamel. In regard to the formation of the enamel, he gives these theories, the last of which he regards as the most probable, and this is, that the prismatic cells separate from the enamel membrane, grow into the enamel, and then become ossified, which, as he states, brings this theory in harmony with the development of other tissues.

The dentine, which he calls the peculiar substance of the tooth, is made up of canaliculi and a structureless basis-substance. The canaliculi he believed to be empty, from the fact that he succeeded in coloring them with ink. In reference to the formation of the dentine, Schwann states that he is unable to give a definite account of it, and after quoting Purkinje and Raschkow, admits that he cannot agree with them, and further on states that we have to regard the dentine as composed of fibers (basis-substance), between which the canals, possessed of separate walls, are present.

But he asks, in what relations stand the fibers and the canaliculi to the cells (odontoblasts), and believes it possible that the dentine is the ossified substance of the pulp. He also states that as the cylindrical cells (odontoblasts) are ossified, they are replaced by others, which are formed out of the round cells of the pulp. Schwann then returns to the question, what are the dentine canaliculi, and states that at first he regarded them as identical with the canaliculi in bone-tissue, which are, as Schwann says, continuations of the bone-cells. This author noticed fine fibers upon the surface of the pulp of pig's teeth, which were attached to the cylindrical cells, and which, in their position, corresponded to the dentinal canaliculi. But he was unable to observe such formations in human teeth, and therefore abandoned this theory.

In regard to the bony substance (cementum), Schwann states that it is identical with the ordinary bone tissue, and thus requires no special explanation.

Kollmann (Sitzungsberichte der K. B. Academie der Wissenschaften zu Munchen, 1869, page 162) asserts that the enamel cuticle is present on every tooth, and even upon those of adult persons which have been in use for many years. The enamel cuticle, (Schmelzoberhautehen,) according to the views of Kollmann, is the youngest layer of enamel. (This the authors have depicted on page 284, Vol. VIII, Fig. 8.) This cuticle in the embryonal state is situated between the newly calcified enamel and the ameloblasts, while upon the crowns of the teeth which have penetrated the gums it is represented by the outermost layer of enamel which is covered by another (Nasmyth's) membrane, and which, according to Kollmann and Erdl,* is nothing but a thin layer of flat epithelia derived from the mucous membrane of the gum. (The same view has been entertained by the writers.) Kollmann further states that each enamel cell is enveloped by a thin membrane, and this membrane is very distinct at the free margins, where it is from $\frac{1}{1000}$ to $\frac{1}{2000}$ m.m. thick, and covers the newly formed enamel in the form of a light streak, which, after the whole enamel is formed, is itself calcified and remains upon the enamel as "Schmelzoberhäutehen." Kollmann regards this membrane, which, by Huxley, was called "membrana preformativa," to be the specific organ which excretes the

* Münchner Academie Abhandlungen Math. Nat. Klasse, 1862, page 221.

enamel, and states distinctly that the formation of the enamel grows on under this *membrana præformativa* (Schmelzoberhäutchen).

Emil Dursy (*Zur Entwicklungsgeschichte des Kopfes des Menschen und der höheren Wirbelthiere*, Tübingen, 1869, page 211) gives a good description of the formation of the primitive fold, and also mentions the occurrence of epithelial nests derived from the external epithelium.

Thomas H. Huxley (*Quarterly Journal of Microscopical Science*, London, 1853, page 149) confines himself to the description of the pulp, the capsule and the enamel organ, and their relations to the dentine, enamel and cementum, as well as the soft tissues contained in them. In regard to the pulp, he opposes the idea of Goodsir, but is of opinion that it grows upward from the basement membrane of the oral mucosa, and is in connection with the tooth capsule. The epithelium (enamel-organ) is situated between these two formations, as stated by Huxley. In reference to the relations of the enamel, dentine and cementum to the above formation, this author states: "Neither the capsule nor the 'enamel-organ' takes any direct share in the development of the dental tissues, all three of them—viz., enamel, dentine and cement—being formed beneath the *membrana præformativa*, or basement membrane of the pulp." These assertions were based upon the fact that when strong acetic acid was applied to a specimen from a human foetus of seven months of age, a membrane about $\frac{1}{1500}$ to $\frac{1}{1600}$ of an inch in thickness became detached. He further states "that at its lower edge this membrane gradually loses all structure, and passes into the *membrana præformativa*. In fact, it is the altered *membrana præformativa* itself." In regard to the development of the dentine this author states "that the pulp is not converted directly into the dentine, and that the structure of the latter does not depend upon the calcification of pre-existing elements." On the development of the enamel, he further states: "Still less can the enamel be produced by any conversion of a cellular structure. Between it and anything which can be called a nucleated cell, it has on the outer side Nasmyth's membrane; on the inner, the layer of dentine, which in man is formed before it. The fibers of which it is composed are structureless, and almost horny; and I think we must be content for the present to consider its existence and its structure as ulti-

mate facts, not explicable by the cell theory." On the cementum we find that Huxley has noticed the striated appearance of the neck of this tissue as mentioned in the *Dental Cosmos*, 1879, page 650, as he states: "In a morphological point of view, the relations of the cement show it to be homologous with the enamel." * * * The upper portion of the cement exhibits in places a very distinct transverse striation, resembling its perfect enamel." This author also mentions that Nasmyth's membrane is identical with the structure of the enamel, but at the same time states that it is certain that this layer is cementum.

His researches are concluded as follows :

1. "The teeth are true dermal structures, formed by the deposition of calcareous matter beneath the basement membrane of a dermal papilla, or that which corresponds with one."

2. "Neither the capsule nor the enamel organ, which consists of the epithelium of both the papilla and the capsule, contribute directly in any way to the development of the dental tissues, though they may indirectly."

3. "The histological elements of the pulp take no direct part (except, perhaps, eventually in the cement) in the development of the dental tissues, becoming either absorbed or being pressed in by the gradual increase of the latter. The Conversion Theory is, therefore, as incorrect as the Excretion Theory, and the dentine is formed, not by ossification of the histological elements of the pulp, but by deposition in it," *parenchymate materiam suppositante*. After which the author refers to the analogy of the teeth to the hair.

George Rolleston (*Quarterly Journal of Microsc. Science*, London, 1872, page 109), on the development of the teeth of mammals, observed blood vessels to be present in the stellate reticulum of the enamel organ at the time when the formation of the enamel is most active. He regards the stellate tissue to be the matrix of the enamel cells, but does not mention anything more about the formation of the enamel.

E. Mühlreiter (*Deutsche Vierteljahrsschr. für Zahnheilkunde*, 1868, page 168) only examined human teeth after shedding, and is of opinion that the formation of dentine is accomplished in the same manner in a young growing tooth as in its earlier stage when still within the tooth-sac. This author believes the odontoblasts to

be composed of two distinct layers of cells. One set is in direct connection with the dentinal fibers; the other is directed with their long offshoots toward the central portion of the pulp, and thus the pear- or club-shaped ends of each layer of cells are in loose contact. He derived at this conclusion from the fact that when a freshly extracted tooth was split, and the pulp removed, he never could find a single process upon the surface of the pulp, while the surface of the pulp-chamber exhibited the majority of odontoblast cells, in situation, with their processes extending into the dentinal canaliculi. Regarding the formation of the basis-substance of the dentine, he indorses the opinions of Kölliker and Lent, viz., that it is a secretion derived from the odontoblasts, which gradually elongate and become the dentinal fibers, but he states that in this respect he goes even further than Kölliker, believing that the excreting process is really accomplished by the vessels of the pulp, and that the odontoblasts are only passively engaged in the formation of the basis-substance of the dentine.

Ch. Legros and E. Magitot (*The Origin and Formation of the Dental Follicle*. Translated by M. S. Dean, Chicago, 1880) say as to the origin of the "stellate cells" of the enamel organ (page 78): "These starred bodies are formed directly at the expense of the polygonal elements, composing the internal mass of the enamel organ. The process is as follows: The basis-substance interposes itself little by little between these originally small polyhedral cells, and thus their walls lose their mutual contact, except at certain points where they still cohere." (Page 80): * * * "These elements of the enamel organ, notwithstanding their stellate form, must be regarded, therefore, as absolutely epithelial in their nature." Nothing is stated in this book about the development of the enamel dentine or cementum. (Page 66): "The epithelial proliferations (buds of the external epithelium), according to Kollman and Magitot, may become the enamel germs from which the supernumerary teeth originate."

Ch. Robin and E. Magitot (*Journal de Physiologie de Brown-Séquard*, 1860-1861) give a theory of follicular evolution, according to which the dental bulb is the first part of the follicle that appears in the depth of the jaws, at the bottom of the grooves. * * * Afterwards the enamel organ is seen; and the wall emanating from the bulb, and rising upon the sides of these organs so as

to surround them, and to unite at the apex of the *follicle*. Maggot, however, in the book above quoted, admitted that the order of genesis was misconceived, and the enamel organ makes its appearance before the bulb (papilla).

(TO BE CONTINUED.)

AN ATTEMPT TO CONSTRUCT AN ANTISEPTIC MOUTHWASH.

BY W. D. MILLER, BERLIN.

When at the beginning of the present decade, through the most exact methods of bacteriological investigation now in use, the true (parasitic) cause of one disease after another was brought to light, we had many reasons to hope that the helpless position of medicine in the presence of the severest infectious diseases was soon to be changed. As yet, however, our expectations have not been realized. With the exception of the still somewhat doubtful triumphs of Pasteur over anthrax and hydrophobia, very little advantage whatever has resulted to therapeutics from the eminent bacteriological discoveries of the last ten years. Consumption, cholera, typhus, diphtheria, syphilis, have not become less terrible through the discovery of the specific micro-organisms of these disorders. Diseases which come under the treatment of the dentist form no exception to this statement.

The fact that decay of the teeth is of parasitic origin having been once established, the thought suggests itself that we ought to be able, by means of properly chosen antiseptic materials, not only to arrest decay, but to prevent its appearance. This is, indeed, the avowed object of the very many antiseptic mouthwashes now in the market. As a matter of fact, however, there is no evidence that anything whatever has as yet been accomplished in the prophylactic treatment of the teeth through the use of antiseptic mouthwashes, and it is evident that any one who would discover some means by which the often fatal ravages caused by decay of the teeth might be held in check, would thereby confer a great boon on humanity.

Not in the hope of accomplishing this, but of contributing some-

thing towards its accomplishment, the experiments were made which form the subject of this paper.

The object of the experiments has been to find some substance or some mixture which might be used with impunity in the human mouth, and at the same time be sufficiently strong to effect an approximately thorough sterilization of the same. None of the many mouthwashes with which I am acquainted, unless we except Listerine, makes even an approach to accomplishing this, the majority of them having at most only a slightly astringent action and an agreeable odor and taste. In fact, there is some ground for the assertion that mouthwashes have done more harm than good.

People who have not the patience or energy to give their teeth a thorough cleaning, quiet their consciences by rinsing their mouths with some "antiseptic" mouthwash, in the belief that they are thereby doing all that is really necessary to insure the conservation of their teeth, whereas, in fact, the chief agent for the conservation of the teeth is the toothbrush; without it the strongest antiseptics will accomplish very little, and any one who puts aside the toothbrush for a mouthwash does it to his own harm.

A few experiments having the present object in view were made about four years ago, and published in the *INDEPENDENT PRACTITIONER* for August, 1884.

During the present winter I have extended my experiments somewhat, and added a few new substances to the materials experimented upon. The chief of these were salol, aseptin and acetate of aluminium.

Salol was first recommended by Sahli as a mouthwash. A teaspoonful of the concentrated alcoholic solution added to half a glass of water gives an emulsion, the particles of which are supposed to be deposited in the fissures and cavities of the teeth, where they exert a permanent antiseptic action. Sahli saw good results from its use in a case of soor, the growth disappearing after a very few applications. *Salol* is a very pleasant remedy, but unfortunately I have found that it is almost useless as a mouthwash, solutions much stronger than the one given above producing almost no action whatever in either of the series of experiments described below.

Aseptin is an antiseptic of low power, compared to thymol, carbolic acid, etc., but it has a decided advantage over them, in that it may be used in much more concentrated solutions. Fifty per cent.

solutions (in which strength it may be used in the mouth) have a considerable antiseptic power, and may take the place of water in preparing mouthwashes, as suggested in solution No. 6. It does not, however, in combination with other antiseptics, increase their power in the expected degree. The same appears, however, to be true of all antiseptics which I have examined in regard to this question. If we combine two antiseptics, each of which has a certain action in one minute, it does not follow that the mixture would exert the same action in half a minute, or double the action in one minute.

Acetate of aluminium is an old medicament, still adhered to by many physicians; it combines considerable antiseptic power with a very strong astringent action. The strongest solution which can be used in the human mouth had in some cases a marked action, but on the whole, not strong enough to encourage me in its use.

My aim in the experiments to be ascribed was to combine a number of antiseptics in such a manner as to produce the greatest possible antiseptic action, with the least possible action on the mucous membrane. The fact that those substances which have a marked deleterious action upon the protoplasm of micro-organisms, act at the same time either as powerful local irritants upon the animal tissue to which they are employed, or as systemic poisons, or both together, has proved to be one of the greatest, or indeed the greatest, hindrance in the use of antiseptics in counteracting infectious diseases. The same difficulty is encountered in a high degree in the attempt to sterilize the human mouth. The sensitiveness and delicacy of the mucous membrane of the human mouth excludes the use of all escharotic materials except in very dilute solutions; other materials of great value, such as bichloride of mercury, we hesitate to use through fear that the small quantities taken up by the mucous membrane or swallowed may produce mercurial poisoning.

A third class of antiseptics is excluded because they have a solvent action upon the teeth, and still others because they have a disagreeable smell or taste.

For these various reasons, the task of finding a mouthwash for daily use which has a pronounced devitalizing action upon the bacteria of the oral cavity is one of exceeding great difficulty, and one which unfortunately will probably never be thoroughly accomplished.

My experiments were made on the following mixtures:

(1.)	Bichloride of mercury.....	0.025
	Water.....	50.00
(2.)	Water.....	50.00
	Alcohol.....	5.00
	Tinct. eucalypt.....	0.75
	Benzoic acid.....	0.15
	Thymol.....	0.0125
(3.)	Listerine....	25.0
	Water.....	25.0
(4.)	Aseptin.....	25.00
	Water.....	25.00
	Alcohol.....	5.00
	Tinct. eucalypt.....	0.75
	Benzoic acid.....	0.15
	Thymol....	0.0125
(5.)	Water.....	50.00
	Alcohol.....	5.00
	Tinct. eucalypt.....	0.75
	Benzoic acid.....	0.15
	Thymol....	0.0125
	Bichloride of mercury.....	0.025
(6.)	Water.....	25.00
	Aseptin.....	25.00
	Salol.....	5.00
	Alcohol.....	5.00
	Acetate of aluminium.....	1.50
	Benzoic acid.....	0.15
	Thymol.....	0.0125
	Tinct. eucalypt.....	0.75

These mixtures are not mouthwashes, but they might serve as bases for mouthwashes, as indicated at the end of this article.

The alcohol was added only as a solvent, not because of its anti-septic powers.

With these mixtures a series of experiments were made. The first series was carried out in the manner described in the *INDEPENDENT PRACTITIONER* for August, 1884.

In this series over 1,500 inoculations were made, and the results obtained were found to be somewhat at variance with those published previously, in so far as longer time was required by the different solutions to devitalize the micro-organisms acted upon, than is given in the table published in the *INDEPENDENT PRACTITIONER*.

This difference may, however, be readily accounted for by the fact that I, this time, made use of a different bacterium, which, without any doubt, has a greater power of resistance than those before experimented upon.

As a mouthwash, we need above all a solution which acts *quickly*, and which does not simply prevent the development of micro-organisms while it is acting, but which devitalizes them.

There are agents which, even in very dilute form, if applied constantly have a powerful antiseptic action, inasmuch as they prevent the development of such micro-organisms as may be present without, however, devitalizing them; such agents are of no more value as antiseptics in the treatment of the oral cavity than an equal amount of distilled water. It is seldom that any one in rinsing his mouth will retain the wash longer than one minute, and an antiseptic mouthwash, to be efficient, should be able to devitalize the micro-organisms with which it comes in contact within this short time.

Solution No. 5 accomplishes this for nearly, if not for all, micro-organisms in the vegetative form. A solution which devitalizes spores in one minute is out of the question, and, in fact, is not at all necessary, since the conditions which lead to the formation of spores do not exist in the mouth, where we find almost exclusively the vegetative forms.

This solution (No. 5) has a decided action in one-fourth to one-half minute; in one minute the sterilization is nearly or quite complete.

Next to this came the solutions Nos. 6, 4 and 3, in close order; the addition of aseptin and acetate of aluminium, both of which, but particularly the former, are antiseptics of considerable strength, did not produce the hoped-for increase in the action of the solution.

The addition of salol had, as I anticipated, no effect whatever. These solutions produced a decided diminution in the number of colonies in a half minute; a complete sterilization usually required two minutes, sometimes even longer.

Nearly as strong as these solutions was a fifty per cent solution of listerine, which also has the advantage of a very agreeable taste and odor.

Now it very often happens that the centers of decay about the teeth are filled with particles of food, and we do not in such cases have liquids to sterilize, but solid substances impregnated with micro-organisms; what effect can we produce upon these by the action of the solutions given above?

To determine this question, a second series of experiments was made in the following manner:

Small porous bodies (bread, meat, paper, etc.), of as nearly the same size as possible, were saturated with solutions charged with certain micro-organisms, or with stale saliva, then subjected to the action of the antiseptic solutions during a specified length of time, and then put into culture gelatine and the number of colonies which developed determined. The stronger the antiseptic and the longer the time of exposure, the less will be the number of colonies which develop in the culture tube. As control, the experiment was repeated, using sterilized water instead of an antiseptic solution.

To avoid transferring too much of the antiseptic to the culture tube, the piece is placed for an instant on sterilized blotting paper, to remove the excess of liquid. I give the results of one of these experiments below. In this solution No. 5 was made use of, and *small* pieces of bread charged with bacteria subjected to the action of the solution 20, 35, 55, 70, 90 and 120 seconds respectively. The control tube developed 4,500 colonies:

Tube 1.	(20 seconds, action)	developed 420 colonies.
“ 2.	(35 “ “)	“ 46 “
“ 3.	(55 “ “)	“ 250 “
“ 4.	(70 “ “)	“ 13 “
“ 5.	(90 “ “)	“ 1 colony.
“ 6.	(120 “ “)	“ remained sterile.

It may appear strange that tube 3 should develop more colonies than tube 2, but such irregularities often occur, owing to the fact that it is not possible to obtain pieces of bread or meat of *exactly* the same size and consistency. The result of the experiment is, however, very clear. When large compact pieces were used (as large as a pea, for example), such as may sometimes be found in cavities of decay, it required as much as ten to fifteen minutes to effect a complete sterilization. The lesson is plain. Even such a powerful wash as the one under consideration will accomplish but little in sterilizing the human mouth when the centers of decay are stuffed full of food. This is also the reason why excessive smoking, notwithstanding the fact that tobacco smoke is a powerful antiseptic, does not insure the teeth against decay; the smoke passes over the surface, but does not penetrate to the point of action. It follows that the use of the mouthwash should always be preceded by the thorough use of the brush or tooth-pick, removing at least all larger particles of food and opening the spaces between the teeth, so that the wash may penetrate to the vulnerable point. If this is conscientiously done, I am convinced that we have in solution No. 5, and, in a less degree, in the other solutions specified, a powerful means of preventing the excessive ravages of decay. The solutions, 2 and 5, may be made use of in the following form:

No. 2.	Thymol.....	9.25
	Benzoic acid	3.00
	Tinct. eucalypt.....	15.00
	Alcohol abs.....	100.00
	Oil of wintergreen.....	25 drops.
	Or oil of peppermint.....	20 "

In use, enough of this mixture is added to a mouthful of water to produce a decided cloudiness.

The wash, no doubt, may be rendered softer and more palatable by the addition of glycerin, tinct. of katechu or something of the kind. Perhaps some one who is interested in mouthwashes will kindly undertake the task.

No. 5 is prepared in the same way, with the addition of 0.8 bichloride of mercury.

Rx.	Acid thymic.....	0.25
	— benzoic.....	3.00
	Hydrarg. bichlorid.....	0.80
	Tinct. eucalypt.....	15.00
	Alcohol absolut.....	100.00
	Ol. gaultheria.....	gtt. xxv.

Naturally, every one is shocked at the idea of putting bichloride of mercury in a mouthwash, but I think a more thorough consideration of the question will show that it is not so reprehensible an act as may at first appear.

The strength in which the bichloride is used in the mouth is about $\frac{1}{2000}$. Let us suppose that the patient swallows of the solution two grams daily (as a matter of fact, one need not swallow any at all); it would require one hundred days to have swallowed 0.1 grams of the salt, which is the maximum dose for one day. In this matter, however, reasoning is of little value; nowhere is the saying in medicine, experience is of greater value than reasoning, truer than in questions dealing with the physiological action of the salts of mercury. I, myself, have made extensive use of the above formula without a trace of any physiological or toxicological action, and if a sufficient number of members of the profession would make a trial of this solution upon themselves, and report the results in the *INDEPENDENT PRACTITIONER*, a great deal would be done towards solving the question of the advisability of recommending the wash in practice. The taste of the bichloride is disagreeable, even in very dilute solutions; it may, however, I hope, be disguised by the addition of proper substances.

Unfortunately, our pharmacopœia is not yet so rich that the physician or dentist can restrict himself to the use of good-tasting medicaments.

On the whole, after a very great number of experiments, I have come to the conclusion that a thoroughly efficacious mouthwash cannot be constructed with the substances now at command, without the use of bichloride of mercury.

ANÆSTHESIA—PHYSICAL AND PSYCHICAL.

THE PHYSICAL AND PSYCHICAL EFFECTS OF NITROUS OXIDE GAS, ESPECIALLY
ANÆSTHESIA PRODUCED BY PSYCHICAL METHODS; ABSOLUTE
ANÆSTHESIA PRODUCED IN CASES OF SENSITIVE DENTINE.

BY B. A. R. OTTOLENGUI, M. D. S.

READ BEFORE THE CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

While I have selected as my subject Anæsthesia, it is my intention to consider the condition only as produced in one or two ways, selecting such as have special adaptability to our uses in the practice of our profession. I shall speak particularly of Nitrous Oxide Gas as what may be termed a physical agent; I will attempt to tell how to cause local freedom from pain psychically, and explain a method of obtunding sensitive dentine in carious teeth.

You all have undoubtedly learned what our text books have to tell us, and have supplemented your knowledge by practical experiences; I shall therefore give you only such opinions as I have embraced after years of practice, and recent special experiments with the gas. I have administered this agent many hundreds of times for dental operations, as well as to aid the surgeon, and I have met with many curious cases. Within the past two years I have thought to myself that whereas I have learned to act in emergencies, as we say instinctively, it would be as well to endeavor to define for myself and others the practical results of my experience. As soon as I began to cogitate on this I found myself constantly seeking for the reason why I departed from a special routine in special cases; why I administer the agent fearlessly to one person and with greatest timidity to the next. In order to find a reply, I determined to inhale the gas myself by way of experiment, and also to study effects closely in others. I shall therefore commence this paper by describing the experiments in the order in which they were made.

EXP. 1. This was with the object of determining at what stage the control of muscular effort would be effected. During inhalation I

attempted to keep up a regular and continuous motion of the hand and forearm, by raising and lowering them alternately; I also endeavored to notice other effects as they might occur. I will describe the experience in this case somewhat in detail, with the statement that it was, generally speaking, repeated in all subsequent experiments. At the first inhalation nothing was noticeable beyond the fact that the gas did not seem to be as easily breathed as the air. At the second inhalation a decidedly sweet taste, which continued to the fourth, and then ceased abruptly. Immediately at the beginning of the fifth inhalation there was a gradual feeling of warmth in the lungs, increasing almost to a sense of heat at the beginning of the sixth. Abruptly this ceased, and was followed by a slight feeling of cold, with tingling at the toes. I do not say extremities, because there was as yet no disturbance in the fingers. It will here be seen that this sensation of cold began at the sixth inhalation. I wish at this point to call attention to the fact that it required on this occasion eighteen inhalations to exhaust the receptivity of the system, and as all my experiments bear me out, I make the assertion that the exhibition of the agent may be divided into three periods, in exact proportion to the amount consumed. Thus in my description I have reached the beginning of the second period with the seventh inhalation. Now for the first time the patient begins to realize that he is about to be controlled by a power he cannot resist. (When I say "cannot," I do not mean there are no exceptions to this rule.) My experience from the sixth to the twelfth inhalation may be most aptly described as that of a naked man slowly letting himself down into cold water; though, to be more exact, the sensation of cold seems to be rising about one. In this experiment it must be remembered that the dominant idea was to keep the hand in motion, and it seemed to me that I succeeded; that is, I was at all times conscious that my hand *must* move, and that it *was moving*. Nevertheless, despite the fact that the mind was ever charged with this, it was also receiving the most exquisitely pleasant impressions. I thought that the world was slowly being left behind, and that my spirit, released from its earthly cage, was soaring up and ever up, experiencing the happiness that has so often been promised in the future state. It was at the beginning of the twelfth inhalation that I began to hear ringing sounds in the ears, which soon changed to such music as is indescrib-

able. I was cognizant of fourteen inhalations, and after that my whole being seemed too much entranced to attend to earthly matters. I seemed to struggle with the desire to know and be able to recall my experience, and with the wish to abandon myself to the ecstacy of my new or changed being. At last all earthly ties were severed, and in fancy I was living a lifetime, when sharply and suddenly I awoke to the realization that I was again in my office, rather confused, but still enthralled with the rapture of having for a time been freed spiritually. This, as I say, was my experience then, and is always. There is one thing I must notice, however, and that is that I always awake astounded that years of time have not passed. It is also some time before I care to make any effort at either motion or speech; in fact, the tongue seems thick, or the vocal chords paralyzed for many seconds after I am restored to consciousness of surroundings. As soon as this occurred in the experiment, I questioned the gentleman who administered the gas and learned to my surprise that I had *continued the motion of the head as long as I inhaled, and ceased abruptly as soon as I breathed one draught of atmospheric air.* I now propose giving the bare facts brought out in the experiments and make comments and deductions afterwards.

EXP. 2. An effort to test hearing. I instructed the operator to count aloud during the administration. I heard from one to fifty-three in numerical rotation, and then came forty-six, forty-seven, forty-eight, fifty-one, fifty-two, twenty-nine, thirty, one hundred and eight, one hundred and nine and one hundred and fifteen. As soon as I found that the numbers came to me irregularly, I concluded that my hearing had been modified, and dismissed further thought of the matter. Upon my awakening, however, I learned that the operator had really counted as I heard him. This I consider a fortunate accident. Had he obeyed my wishes, and I therefrom concluded that I could hear up to any point I might name on awaking, it would not be really proven, for this reason. I am satisfied that *the intellect* is never entirely controlled, if at all, and, therefore, in the endeavor to follow his counting I might receive the first impressions objectively along the auditory tract, and so getting accustomed to the intervals, continue the counting after the paresis of the auditory nerve occurred, and thus be able to approximate the point actually reached in the counting.

EXP. 3. An attempt to study the effects on sensation, sight and hearing. Result.—I heard counting up to one hundred and fifty-six, the actual count being one hundred and sixty-eight. The sight was tested by watching a view from the window, and seemed to have been undisturbed. Sensation was tested by pricking the hand. There was a gradual lessening of feeling, continuing to diminish till it was gone entirely at the eleventh inhalation, or the end of the second period.

EXP. 4. A man aged twenty-one. I counted slowly up to fifty. The patient reported that he heard forty. At forty his lips and eyelids became blue. I pinched his hand during the experiment, and he reported a cessation of feeling at thirty. The patient held the inhaler, and his arm did not drop, even after removal of the mouth piece. He became violently convulsive as soon as the inhaler was removed. He was allowed to recover gradually, and the twitchings continued until he regained consciousness.

EXP. 5. Same patient, with an interval of only five minutes. Fifty-eight was counted (faster than before). He heard up to forty. His hair was pulled during the administration, and his report was “no feeling after twenty-eight or thirty.” I considered him insensible to pain at twenty-eight, the twitching of the eyelids, which had been caused by the pain, having ceased at that point. He passed urine copiously. Not to take up this again, I will here say that I have known this to occur so often that I deem it advisable that the bladder be emptied before taking gas.

EXP. 6. Not being satisfied as to the correctness of the result of the experiment as regards sight, I next took the gas myself with the special design of settling this question. I instructed my assistant to take hold of the cord of the window curtain, and as soon as he thought I appeared about to succumb, to commence pulling the curtain up and down. The result was that I made the discovery that the sense of sight departs suddenly, nothing occurring till at the twelfth inhalation. At the end of the second period I saw the gentleman move his hand up on the cord and take a firm hold as though about to begin the movement; I recollect that I then glanced up into his face, and saw his eyes turned towards the window; I therefore turned my eyes back to that point, expecting to see the curtain move, but at that instant vision ceased. I learned afterward that he commenced moving it at the fifteenth inhalation. The ap-

parent discrepancy of results in these two experiments I will explain later.

EXP. 7. Subject, self. The operator was instructed to continue counting even after removing the inhaler, in order to test the duration of paresis of the auditory nerves. I heard the counting up to ninety-six, the next sound being one hundred and seventy-two. The inhaler was removed at one hundred and sixteen. The up and down motion of the hand was kept up until the inhaler was removed.

EXP. 8. Patient, a lady, aged twenty-two. Counted up to one hundred. She heard ninety-four. Motion of the hand ceased at seventy-eight. Counted one hundred and seventy-five before consciousness returned. At one hundred and twenty-five the motion of the hand recommenced, and kept up till she was thoroughly awake. During the interim a slight tremor was present, as though an effort was being made to continue the motion, although ineffectual. The cessation of motion corresponded with the first indication of cyanosis in the face.

EXP. 9. A case in actual practice. Female, age twenty-two. Gas was administered for the purpose of removing a pulp. Dr. F. Bradly, of Newport, being present and assisting. I directed the patient to beat with the hand as long as possible. She did so up to the last two inhalations, and then followed a trembling of the member, as in the last case. I opened into the pulp-chamber with the engine bur, and then with a broach removed the pulp. At this point her eyes opened and signs of returning consciousness appeared. I changed the bur, replacing it with canal reamer and reamed out the canal. Upon the return of consciousness the patient reported no pain.

EXP. 10. Same patient. Removal of a tooth; twenty-seven inhalations, the motion of the hand as requested being kept up to the twenty-fifth. After extraction the patient was allowed to remain undisturbed, and timed by a watch, two minutes being allowed to elapse. During this time the patient talked aloud and seemed conversing with some friend. This case is specially interesting. In all my experience I have had but two patients who talked, the first being one who feared she would "tell her secrets," and in fact revealing the name of her lover while under the influence of the gas. In the present instance I had related this fact to the patient

just prior to administering the gas, and also told her to think of some one of whom she was fond. The result was the repetition of a conversation had with her intended the night previous. She told me afterwards that she thought she was at home, and going over this scene, and when I related what she had said, she claimed that it was almost verbatim what had passed. It can scarcely be imagined how singularly this sounded. A girl, apparently asleep, and yet speaking aloud with intervals between, as though another was conversing with her.

These are not all the experiments I have made, but they will suffice to bring into prominence the points I wish to make. What then do we learn, and what useful deductions can we draw from these facts? Bear in mind, first, that in all the universe we find no two creations, animate or inanimate, identical, and that, therefore, it is manifestly impossible to state dogmatically that a special agent will accomplish a special result. I have found patients particularly susceptible to this gas, and others on whom no amount taken into the lungs would produce the least anæsthetic effect. Nevertheless, for general purposes, the statements I make in regard to its action will be found true, the limitation being only in degree in correspondence with the individuality or soul power of the subject. I have investigated the action of the gas on special sense only as to sight, hearing and touch, taste and smell being matters of little moment to us whilst operating, though it would of course be interesting to extend research in this direction. I have also tried to learn the effect on the will and on volition, when I introduced a motion of the hand during inhalation. The result is that impressions along the nerves of sight and hearing cease abruptly, whereas the sense of touch or feeling is overcome by degrees. Again, sight and hearing are only lost in the third stage, whereas feeling begins to lessen at the beginning of the second. These are points of great usefulness to the operator, and if thoroughly understood will enable him to administer the agent with satisfactory results to almost all classes and conditions of patients.

How then shall he be able to determine the boundary lines of the different stages? Not by counting inspirations, for one patient will take only ten, where another will take as many as thirty-five breaths before stertor commences. The chief object in view is anæsthesia—in its strict derivative sense, freedom from pain—and this

has been demonstrated to occur at the end of the second stage. Operations can be performed with perfect safety at this time, and with certain immunity from pain. How shall this moment be recognized? In a very simple way. Having divided the effects into three periods, as the result of my personal experiences, I next endeavored to find the outward signs which would be coincident with the end of the second period. This I accomplished by watching the faces of subjects, counting aloud, and causing continuous sensation by pulling the hair, pricking, etc., and then by asking at what period of my counting the cessation of feeling had occurred. The sum of these inquiries is, that the patient ceases to feel at the exact moment when the first appearance of blueness occurs, and this will generally be first detected in the capillaries of the eyelid. If for any cause the operator has any anxiety as to the safety of his patient, let him press the agent no further, but remove the inhaler and operate swiftly. It is indeed a safe rule never to go beyond this point unless there be special reason for desiring a prolonged sleep, as, for example, in removing a number of difficult roots. I have further shown by the examples cited that as the sense of touch is the first to be overcome, it is reversely the last to be restored, and therefore it follows that the operator may continue even after the eyes begin to open and the patient to show signs of consciousness.

I will here insert a case from actual practice, showing the truth of my statement in regard to the time at which the sensibilities are benumbed. Patient, a female, aged twenty-five. Operation to be performed—the stretching of the sphincter of the rectum. I have frequently given the gas for the gentleman who operated in this instance, and on former occasions had proceeded as follows: I would allow the patient to take all the gas possible, and then giving the sign to operate, turn the gas off and let air be breathed until the blue discoloration in the face had almost passed away, and then give the gas again, thus alternating air and gas as long as required by the surgeon. In this way I have kept a patient under influence for forty-five minutes, rectal tumors being removed, three in number. In the present instance I gave the signal to operate as soon as the first blue color appeared around the eyelids, and by the time the patient had become fully cyanosed the work was accomplished. She reported absolutely no pain or consciousness of the operation. I will state, too, that it has been my observation that the pain re-

sequent on stretching this sphincter is harder to overcome with gas than the actual use of the knife.

As to hearing, there is little to say beyond the fact that it should be remembered that the patient can hear almost as long as he continues to inhale the agent, and therefore it is possible to give continued directions as to manner of breathing, etc. In the last case, after giving the signal to the surgeon and he had commenced to operate, my patient opened her eyes. I at once directed her to close them, and she obeyed promptly, proving not only that she heard, but that the power to obey still lingered. This knowledge of the continuousness of hearing can be made very useful in soothing disturbed emotional conditions.

As to sight, it will be remembered that in one case I reported that it had not been affected, and in the next that it had been entirely obliterated. In the first instance I gazed on a still view, seen through the window. Thus, although the sight was lost, it went so instantaneously that its going was not a cognizable fact. Its return was similarly quick, and as the view was the same there could be no knowledge of the interim. This, however, proves an interesting fact. In alcoholic anæsthesia, when the patient is recovering from his stupor, he "sees double," to use a common phrase. Why is this? The explanation is as follows: Man has two eyes, and each is capable alone of conveying impressions to the brain, the result of which we call sight. Nevertheless, these two eyes see but one object. This is accomplished by focusing. There is accommodation of the lens in each, which is nicely adjusted to meet required distance, and besides, the eyeballs are so turned by the recti muscles that the two lines drawn from a given point on the object to the lenses will be of equal length. The drunken man fails in this because there is a paresis of the recti muscles. If this were true in the case of the gas, I should readily have discovered a difference of vision in the first instance.

Before coming to the consideration of psychical effects, there are one or two practical points of which I wish to speak. It should be always remembered that if the gas is administered from a reservoir, as is the best method, the first breaths will be difficult, since some force must be applied in order to make it come through and along the tube. Therefore, this should be explained to patients who are apprehensive of danger, otherwise, as soon as it is perceived that

there is a difficulty in breathing, the idea of being suffocated will be entertained, and strenuous efforts sometimes made to remove the inhaler; if successful in this it may be difficult or impossible to induce a second attempt, and if the inhaler is forcibly kept in place, your patient may cry, groan, or even cease breathing, the breath being sometimes held almost to the point of asphyxiation.

Another important matter is the prop or gag. Not very long since a prominent operator in New York was sued by a woman who claimed that she had had a clicking jaw ever since she took this agent at the office of the defendant. She was more or less ridiculed in court and by the press, and lost her suit. I do not mean to pass judgment in this case, for I am not in possession of details and facts, and besides I know the gentleman to be a skilled and experienced operator. But I think there is a profitable lesson to be learned here. Why do we use the prop at all? Because we do not press the agent to the point of relaxation, nor is it necessary, as it is claimed can be done by Paul Bert's method, and therefore we extract whilst the jaw is rigid. But there is more than simple fixity of the jaw, for in that case we still would not need the prop, for the mouth would remain open. There is a violent contraction of the masseter muscles. Now think a moment of the exact position of these wide and powerful muscles, and does it not become apparent that there may be some danger in inserting a prop between the jaws? The farther back it is placed the longer becomes the lever to pull the condyles out of position. Place the prop between the front teeth, and it would be plainly impossible to affect this joint and the ligaments about it. It is not always possible to do this exactly, as the prop would most likely be in the way, but care should be taken not to place a prop back of the centre of the fibers of the masseters. The bicuspid region is perhaps safe enough. A further precaution can be taken in making the props with cushioned ends, using hard and soft rubber.

In the article on the agent in the "American System of Dentistry" I find one remark to which I wish here to reply. "The pulse and respiration are sometimes accelerated at the beginning of the inhalation, and it is not yet possible to determine to what extent these phenomena are due to the action of the gas." They cannot be attributed to the gas at all, except subjectively. We have here the simple result of anxiety, which is a mild form of fear. As to the pulse, it

is an admitted fact that fear produces acceleration of the heart's action. Dr. Hack Tuke says: "Acceleration of the heart's action through the sympathetic nerves is the most frequent and obvious result of emotional excitement." Later, I will give a good example of this from actual practice. As to the disturbed breathing, that is manifest from the very manner in which we see it occur. The anxious patient inspires fitfully, for fear of taking the agent, then holds the breath as long as possible, expiring only enough to allow a new breath which shall receive only a little of the terrible vapor. Thus these short breaths seem accelerations. Mark the difference. A moment later, when the agent begins to act, confidence is restored by the pleasurable sensations produced, and respiration becomes strong, and if then, as we here see, the emotion plays such an important part in anæsthesia, how necessary it is for us to consider and study the principles which surround the question, in order that we may as often as possible send our patient into the happiness of pleasant dreams, rather than the mirage of distorted emotions occasioned by dread! Here comes in the importance of keeping the eyes shut, possessed as we are with the knowledge that sight continues so long; and of course so long as it does endure it is causing impressions, more or less disturbing the peace of the spirit. Secondly, having used our utmost endeavors to calm our patient by our assurance of safety and a pleasing experience, how valuable becomes the knowledge for psychic treatment that he can hear, for can we not thus still further endeavor to dispel any lingering doubts by quietly remarking to our assistant (not to the patient) that he is a "remarkably good subject," that "he takes the gas excellently," etc !

There is now another aspect to be considered. Is it not possible that the condition we call anæsthesia may be induced by purely psychical agents? The answer is, undoubtedly, yes! And there are two classes of this phenomena. First, those caused without intent, and second, where an operator directs such psychic agents with the direct intention of producing this condition. Instances of the first class are seen in hysteria and catalepsy. Very remarkable cases are cited by Dr. Tuke in his work, "The Influence of the Mind on the Body," which I recommend as most profitable reading to all who would pursue this subject. Perhaps the most complete psychical anæsthesia is that caused by religious fanaticism, as exhibited in the convulsionaires at St. Medard. One of these, Nisette by name, was

“struck on the head with a log, and then had the four extremities pulled in different directions. Two men stood on her body, then two on her back, whilst others dragged her up by the arms and gave her the strapado,” etc., inflicting every kind of cruelty possible in the attempt to force her to admit that she could feel, but unsuccessfully.

It is plainly with the second class, however, that we are most interested. Psychic anæsthesia had begun to take a prominent place in surgery, when chloroform was discovered to produce the desired end with such readiness that surgeons at once dismissed all investigations of the condition as superinduced by those methods, which may be all classed under the title, mesmerism. That these phenomena were real, is established abundantly by the fact that a hospital was founded in Calcutta and flourished for ten or twelve years, during which period Dr. Esdaille, the eminent surgeon in charge, operated with brilliant success, painlessly performing some of the most heroic operations known to surgery. Such practice, however, would not be most convenient for practical use by the dentist, although Dr. Esten, of Providence, used this method as early as 1837, in extracting. Then, too, in very susceptible persons, perhaps rare cases, anæsthesia may be induced simply by pretending to administer a known agent. Dr. Take tells of a case of this kind, but I must abbreviate it instead of quoting verbatim. A young woman applied to a London hospital, complaining of three sebaceous tumors of the scalp. It was decided to operate, and she was taken to the proper room and placed in position. At the last moment it was discovered that the chloroform bottle was empty, and while an assistant was sent to replenish it, the operator determined to accustom his patient to the mouth-piece, and placing it to her mouth directed her how to breathe. She did so, of course not knowing that there was no agent present, and after a few inhalations passed into the usual condition. The operator noticing this directed the surgeon to proceed, and one tumor was then removed. Wishing to make a test, he then said: “Wait a moment; she awakens.” At once she showed signs of recovering, but by simply replacing the mouth-piece she returned to the unconscious condition, and so remained whilst the operation was completed and the dressings applied. I have myself experimented in this direction, but not often enough as yet to report with certainty. I have, how-

ever, succeeded in removing a tooth with little pain, and have generally found my patient in a dazed condition, though not unconscious. But I have not pressed these experiments, because if the subject agrees to take the gas I do not hesitate to give it. Thus it is only where I find a patient who so fears the gas that he will not consent to take it that I really need a psychical method of performing the operation, and this I can do very readily, as I shall now describe. And it is at once seen that in such a case I could not cause the condition by pretending to give the gas, because that requires the consent on the part of the patient to have the inhaler placed in position.

Before explaining this method, I must describe one case in which total anæsthesia was induced without intending it. The subject was a highly nervous, ignorant woman. Placed in the chair and the inhaler applied, on the second inspiration she became rigid, ceased to breathe and was plainly unconscious. The extraction was swiftly accomplished, and it was twenty seconds by a watch before she stirred, when she declared that "the gas was loike goin' to hiven intoirly." There is, of course, a principle involved in such a case as this, and it is contained in the words of John Hunter, when he said, "I am confident that I can fix my attention to any part until I have a sensation in that part." Thus the effect of attention. If to this is added expectation of a certain result, the effect will be modified in that direction. Dr. Tuke, in his work already alluded to, explains most thoroughly all the scientific facts behind this statement, and testifies to its verity by very many examples. I have not the time in so short a paper to expound these truths, but having accepted them myself, I proceeded to put them into practice, and perhaps the result of my experience will, after all, be of more practical interest, especially as each can study the principles for himself.

My method is simplicity itself, so far as act is concerned. I saturate a piece of cotton with a little colored water and apply it about the tooth, with the result that in two or three minutes' time I am enabled to remove the tooth or root without inconvenience to my patient. It would scarcely do for me to stop with this bare assertion, for should you follow this prescription it is more than likely that there would be a total failure. Why? I have said that the anæsthesia, though only local, is psychical in character. Colored

water and cotton would scarcely constitute a psychological remedy. Perhaps the best way to explain the working of my method is by an illustration from practice. Some months ago a lady made an appointment to have ten roots in the lower jaw removed, and agreed to take gas. The appointed hour was ten o'clock. On reaching my office at nine I found her pacing the floor. "In pain, madam?" asked I. "Oh, no! But, doctor, I have not slept all night, thinking about that gas. I am afraid if I take it I shall never wake up." "Under those circumstances I would not advise you to take it." "But what shall I do? I could never have them out in any other way." "Oh, yes," I replied, "I know just the way out of your trouble. I have a very powerful remedy, one or two drops of which if applied to the neck of a tooth will so deaden the parts that it can be removed without pain." "What nonsense, doctor; you are fooling me." "Not at all," this said with perfect gravity, "it is a fact, just as I have related." "But what can it be that can act so wonderfully?" "It is called *Goutte d'or*." "What does that mean?" "It means Golden drops. This is a preparation I get from Paris. Shall I show it to you?" I then produced my bottle, which is a curiously shaped salts bottle, green in color and having a silver top covering a tiny glass stopper. This, of course, is intended to have an effect on the imagination. In this case my patient, after looking at and smelling my Golden drops, agreed to come again at the appointed hour, and she did so, allowing me to remove the ten roots by simply placing the preparation on each one alternately. I always do this, though in her case the special reason was that she asked me if, like rhigolone, it might not leave a sore gum afterwards. I at once assured her that the effect was so fleeting in character that it would be necessary to operate rapidly after removing the application, and then renew it for each tooth. Having always in similar manner applied my psychic agent, really existing in my manner and conversation, the actual application itself is useful in that it directs attention to the point to be operated on. Then having taken my watch off my chain and laid it on my stand, explaining to the patient the necessity of exactness in timing the duration of the application, I place a few drops on the cotton and apply it, observing strict silence, and persistently allowing three minutes to elapse before extracting. I am happy to be able to say that thus far, out of half a hundred cases, I have not had a failure. I wish

to exhibit the cast of one, to show that I do not select easy cases. This patient, a lady, aged forty-five, applied to me to remove the two last teeth in the upper jaw, as they were excessively loose. She refused to take gas, and I readily removed the two teeth, one the second molar and the other a supernumerary, though at first I took it for an abortive wisdom tooth. After the extraction she informed me that all were not out. Imagine my surprise, on exploring, to find the cusp of another tooth. I endeavored to extract this, and worked arduously for several minutes, using different forceps and utterly failing to even loosen it. At length she refused to endure more. I tried to persuade her, but in vain. Like a flash of inspiration, I seemed to hear the magic words "Goutte d'or." At once I explained its virtues to her, at length gaining her confidence in its power, and applied it for the space of four minutes, telling her it was a minute longer than usual. I then went boldly up with a bayonet molar forcep, obtained a good grip and removed the tooth without pain, as she reported.

One more case, because of the effect produced on circulation, which I promised earlier in this paper to describe, and which I accidentally discovered. I had the very bad root of a first bicuspid to remove. Having applied the Goutte d'or, I was holding the same against the parts with my forefinger, when I noticed that I could feel the pulsations of the superior coronary artery. This was a good opportunity to test her pulse without her knowledge. I therefore counted, with the following result: First minute, ninety-five, irregular. Second minute, ninety-eight, irregular and slightly faint. Third minute, one hundred, quite irregular, and at times very faint. The root being removed without pain, proving to be bifurcated, I left her for five minutes. On my return I asked to look at the parts a moment, and took the chance to time the artery again, without telling her of my intention so to do. The result was, for one minute eighty-two pulsations, and all firm and regular.

In another case, that of a miss of fifteen years, the pulsations were one hundred and fifteen, one hundred and seventeen, one hundred and seventeen, for the three minutes, while the normal pulsations were subsequently found to be ninety-eight.

As an illustration of the fact that this principle as applied to dentistry is not new, I desire to quote from an ancient work which

was recently shown me, written in the Latin tongue. The title is "*De Superstitione et Vinculis Demonum*," which means, The Superstitions and Tricks of the Demons. The body of the work is devoted to a description of some of the practices of the ancient Magians. In turning over the pages I was attracted by a short paragraph with the heading, "*Dentium dolore*,"—Tooth-ache. Then follows: "*Marcubales Hebræarum digito tangunt dentium ternis diebus mane, ter verba hoc proferentes 'Deus Abraham, Deus Isaac, Deus exercituum, liberet te a dolore dentium.'*"

Freely translated this means: "The Hebrew priests touch the tooth every three days, early in the morning, repeating these words three times: May the God of Abraham, the God of Isaac and the Lord of Hosts deliver you from tooth-ache." A very good example of what is now known as Christian Science, or cure through prayer, and in practice, too, before the advent of the Saviour.

The next paragraph is even more interesting: "*Germanos apud hoc patet experimentum; patiens album filum in aciem positum aperti porrigit, aut per alium præceptorum transmittit, potiusque si superiori dentes, aut inferi torquentur, aliquis notatis in scheda hisce quinque verbis N. A. W. G. E. Si dolore inferiari parti singulas primæ literæ partis in extremitatem prægredi filum in opposita parte extrahens, iterum atque iterum, dolores cessantibus expectans.*" This translated, in substance, is: "Among the Germans we find this experiment. The patient presents the operator with a piece of white thread in a needle, or sends it by some other person, and he, the operator, asks whether it is an upper or a lower tooth which troubles, and having plainly written on a piece of paper these words, N. A. W. G. E. if the pain is in the lower part he pierces each part of the first letter with the needle, pulling it through violently from the opposite side, repeating this again and again until the pain ceases." I regret very much that I cannot translate the magic words which are only given in initials, for it might enable us to try this simple experiment. However, that it must have been efficacious we cannot doubt, for be it observed we are told the operator repeated his trick again and again till the pain ceased. Jestings aside, it must be admitted that tooth-ache was often, if not always, treated by a "charming method" among the ancients. Dr. Tuke quotes from Dr. Ranieri Gerbi, a professor at Pisa, who relates the wonderful therapeutical effects possessed by

an insect which he calls "*Curculio anti-odontalgicus*." It was only necessary to squeeze this insect between the fingers and apply to the tooth to bring relief. Dr. Gerbi relates that, by this process, which clearly owed its success to the imagination, he cured four hundred and one cases out of six hundred and twenty-nine.

A similar practice is still in existence in the Southern States, especially among the negroes in the Carolinas. I cannot tell if the insect is the same, but there they use a small bug commonly found on rose bushes and other flowering plants, and widely known as the "Lady-bug" or "Lady-bird," of which children often sing a little verse. This bug, if squeezed between the fingers, and then rubbed on the gums, is considered a specific.

Although I fear that I have already too long tried your patience, I still shall not close without describing to you how I cause a local anæsthesia in cases of sensitive dentine. In endeavoring to accomplish this I began by theorizing, something as follows:—

The investigations of recent histologists in the laboratory of Dr. Heitzmann, have demonstrated that not only in the dentine, but in the enamel as well, there exists a fiber of living tissue. Moreover, that even the basis substance of the dentine is everywhere traversed by a minute reticulum of similar tissue, which commences as spines from the fibers, and which interlace and anastomose in every direction. Further, that these fibrillæ, if not nerve, are neural tissue, for it can be plainly seen that in appearance at least they are identical with nerve. The dentinal fiber is continuous with, or in juxtaposition to, the odontoblasts of the pulp. Undoubtedly, then, this is the channel through which the sensations resulting in that disturbance of the nerve centres which we call pain is transmitted when we cut across these fibers with our sharp instruments. It has been found almost impossible to antagonize, or more correctly speaking to control, this sensitiveness with any agent yet known. Partial effects have been produced, but with no one method within my knowledge has perfect immunity been obtainable, allowing uninterrupted operation. The methods giving the best results are those which embody evaporation of the moisture in the tooth. This is easily seen. The hot air syringe has its advocates, and chloride of zinc is perhaps the most reliable topical remedy. What have two such dissimilar agents in common? The hot air evaporates, and the zinc crystals accomplish the same result by virtue of affinity for water. The explanation of

this leads to the end. The fibrillæ do not fill the tabuli. This is manifest to the eye of the microscopist, and if further evidence were needed it lies in the fact that the fiber is in appearance like a piece of string with beads put on it at short distances; thus, even if the beaded parts touch the walls of the canaliculi, the parts between cannot. The tube not being filled by the fibers, contains water, which enters by capillary attraction. This is probably taken up mainly from the fluids of the mouth, for when we isolate teeth with the rubber-dam, even those which are not carious soon show by a changed appearance that evaporation has occurred. This also tends to prove that such evaporation is possible. What useful end can this serve? If it is the fibrillæ which transmit the sensation of pain to the dental pulp, if they can be so contracted or benumbed that we, in the first instance, do not cut them, or in the second, find them incapable of normal action, we have practically overcome our enemy.

This may be done as follows: Apply the rubber-dam, dry the cavity with bibulous paper, and then insert a pledge of cotton saturated with absolute alcohol, selected on account of its affinity for water; next direct a series of blasts of hot air to the cavity, persisting till the parts become whitened, or thoroughly dry, usually taking as long as three minutes. It may be as well to mention that what is usually sold as a hot air syringe is not the best to use, from the temptation to make the application of the blast continuous, which will result in pain. It should be applied intermittently; remember that evaporation is what we are seeking, and not the heating up of the tooth, and this may be accomplished as well by stages as by continuous heat, since the supply of moisture is cut off by the dam. When satisfied that the water is evaporated, throw on a continuous spray of ether. This will at first, in about forty per cent. of cases, cause pain, which will, however, almost at once begin to lessen as the spray is continued, and in the end it will be found that all sensation will be controlled. The tooth may now be cut almost at will, and with no change in sensitiveness in consequence of entering the dentine, even to a considerable depth, for undercuts, anchorages, etc.

I have taken up so much of your time that I shall not endeavor to theorize on this to any extent, further than to say that whilst I do not think the contraction of the fiber would entirely account for

the lack of sensation (for we cannot believe that it could be made to contract one-half its entire length, which it must do to allow a deep drill hole without feeling, if this were the only explanation). I believe that this contraction has much to do with the result. However, the result is what will most interest our patients, and this I have found to be uniform. I have used this method now in nearly fifty cases, and have not had a single failure. One case from practice will demonstrate how the method succeeds. The patient presented a tooth which was so sensitive that on drying out with a piece of bibulous paper she fainted. At her next visit I explained what I wished to do, and was able to thoroughly prepare the cavity, and then fill it with gold, without the least pain. This method is also most happy in its results in cases where from recession, the necks of the teeth, especially of cuspids, have become sensitive. In such cases, where it is impracticable to apply the dam, cover the gum tissue with a thin solution of pink gutta-percha in chloroform. This, by evaporation, will leave a film of gutta-percha which will effectually keep the parts dry. I may say interjectively, that fillings may be inserted in this way at times, with much comfort to both operator and patient, thus avoiding the painful clamp. After this film is hard, use the alcohol, hot air and ether spray as directed, and then burnish the surface with a rapidly revolving corrugated burnisher in the engine. If there is softened dentine present, cut away with a gold finishing bur, thus avoiding the danger of going too deep, and follow with the burnisher. I may say that in this way I have successfully operated on the most excruciatingly sensitive teeth, and this state of hyperæsthesia has not supervened.

In conclusion, I can only say that chimerical as some of these statements may appear, they are based on close observation, though it may be that I have improperly understood some of the conditions which it has been allowed me to see. Nevertheless, dim as my light may be, it has illuminated my professional path to an extent for which I am profoundly grateful, and I thank the Almighty Creator that even these dim rays have been allowed to reach and warm my soul, and thus put that inspiration into my endeavor, without which no man may hope to progress.

Thanking you, gentlemen, for your courteous attention, I beg leave to submit my paper, with the hope that if there be any present who can point out to me my errors, he will do so to my benefit.

Reports of Society Meetings.

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SECTION XVIII, DENTAL AND ORAL SURGERY.

REPORTED FOR THE INDEPENDENT PRACTITIONERS, BY "MRS. M. W. L."

CONTINUED FROM PAGE 138.

FRIDAY EVENING SESSION.

Dr. A. H. Thompson, of Topeka, Kansas, read a paper entitled "Does Function Control the Evolution of Structure?"

Dr. Thompson referred to a paper on a similar subject read by Dr. C. N. Peirce at the meeting of the American Dental Association at Minneapolis, and brought forward arguments answering his own question in the affirmative. Evolution of function is not isolated from the development of the organ; adaptation to environment is an attribute of function. Organs may be changed, or rudimentary organs developed for the performance of functions before unknown; new organs are developed in response to new wants, or new movements are developed which the wants give rise to; the development of organs is also in ratio to their employment. In the adjustment of means to ends, the tools are adapted to their work. Through this perfect adaptation, the teeth and jaws alone are sufficient to identify a fossil, or to differentiate species. The teeth are so specialized in structure and adaptation. Life depends on the food supply and the ability to utilize it; the teeth are therefore adapted to the food supply, and modified in that adaptation; otherwise great changes in food supply would cause the extinction of species. Gradual changes modify the development, a persistent change in one direction bringing about a corresponding change in the animal structure, adapting it to its environment. Extensive modifications are the result, not of accident, but of compulsion.

adaptation to food-environment. The use for a thing precedes its growth; the organ is the effect, function the cause; or the preparation of food is the cause, the apparatus the effect. The masticatory apparatus is the most variable, due to the great variability of food; the teeth are developed for a protective purpose, and a special tissue is developed to support them, the whole apparatus becoming more complex according to the nature of food. In the different species, the masticatory area and character changes with the nature of the food. The organs atrophy through disuse, or become mere rudiments, tending to suppression, a subsequent change in habits changing this, and *vice versa*. Hence the inference that physical education will lead to physical improvement, and the importance of teaching habits of mastication, the artificial preparation of our food encouraging idleness in the use of these organs. The suppression of the wisdom teeth and of the laterals is in progress to-day. If the function disappears, can the organ persist?

Dr. W. C. Barrett, who was appointed to open the discussion of this paper, not being present, the discussion was made general.

Dr. W. H. Atkinson being called for, criticised the paper severely as a series of assumptions without reasons behind. What is the purpose of function? Simply the antecedent of request. The mammalian lung was prepared in all its beauty, long before any air enters it. The hydrostatic test of infanticide is infallible; if the lung sinks in water, it has never been inflated; if it has once been inflated, it can never be compressed again. He said the author had gone to the very door of truth, looked through the keyhole, and then sworn there was neither door nor lock, nor keyhole there! In the work of creation all preparation is made beforehand to enable the machine to perform the work lying before it. To study first principles, we must begin with the lowest forms of aggregation—crystallization in the mineral kingdom, cellulation in the vegetable, corpusculation in the animal. The seriated order of consciousness is called mentation; we must seize and comprehend and reduce to milk before we can have nourishment. In the amœba every function is narrowed down to its own individual protoplasmic demand; a mouth is improvised for it, through which pabulum is taken in, enfolded, assimilated, rejected. It feels without nerves, moves without muscles, digests with only a momentary digestive function.

It is a shame for a man to go back on what light he has—saying too deep, too profound. In asking for light, radiance rushes in and fills as far as the real asking goes. If we ask to be filled with only superficial breath, we will get only that; if we ask for thorough inspiration, we will get the cells all filled. Ideas are formed and become into thought, which become opinion, belief, knowledge, consciousness.

Dr. Thompson—"And yet function does control the evolution of structure!"

A paper was read from Dr. J. B. Davenport, of Paris, France, entitled "Harmony and Discord; Health and Disease; Healers and Hinderers."

He said that the life of the individual was the result of the total functional activity of all the organs of the body, all being vital, though some were more immediately essential than others. He compared the organs of the body to an army, of which the medulla is the general, whose surrender paralyzes the entire force; the heart and lungs are the trusted corps; the nerves are the lines of communication, the glands, muscles, etc., being the common soldiers. In perfect health there is perfect performance of all the functions of all the organs of the entire body; all are in harmonious relation. The slightest failure on the part of any one has its final disastrous result; when two parallel lines begin to diverge ever so slightly, they finally grow very far apart. The failure of one organ weakens others; through their comparative strength, some may exercise vicarious functions for a time, but they finally give way; we learn their weak point only when they break. No new organ will replace those removed by the surgeon. Man needs a varied supply of food. The dentist stands guard over the portals to the digestive laboratory, and should not mar and mangle what is so admirably fitted to do the work.

The beginning of digestion is coincident with mastication and deglutition. The saliva is a true digestive fluid, and we must assume that it is essential to the perfect performance of that operation. Both sides of the mouth should be equally competent to perform their functions. The loss of teeth on one side causes an excessive use of the masticatory muscles on the other. Man has been given thirty-two teeth, because that is the number he needs. The average uses all his teeth and keeps them in good condition. The tooth of

civilized men are more subject to disease than those of the savage; the teeth of Americans are softer than those of English and Scotch. If it was not intended that we should use our teeth, we would have fewer teeth. The size and shape of the jaw is conformable to the natural number of teeth, and so of the glands, blood-vessels, nerves, etc. ; they are all related in one general architectural plan. We may think them unimportant, but we should not assume to know the means and ends of creative work. There may be some conditions of life in which the thirty-two teeth are apparently not all needed, but we do not know when they may all be called into requisition. Nature is not so extravagant as to provide against our extractions and excisions, and will not furnish a third dentition to cover the loss of all. When men lose them all it is by the aid of man, or through lack of care. It is not proved that they become less in number or rudimentary, or modified by function.

The importance of the loss of teeth does not lie merely in the loss of masticating surface, but also in the derangement of the remaining teeth, which are robbed of their support, and lose their function through tipping, both occlusion and mastication being ruined. The first molars are needed to support the second and third; the bicuspid, which seem to have but little work to do, serve to preserve the features and to support the other teeth. The race has been much cursed by bad dentistry opposed to natural laws. A man cannot have a series of set rules and adapt each case to these rules. In practice we deal with individuals, not with groups, and must vary according to circumstances and cases. Common sense is the great essential; if our knowledge were as broad as the universe, we might avoid making mistakes.

Dr. W. H. Atkinson having been appointed to open the discussion of this paper said: "In proof-reading we sometimes write on the margin *stet*—I say let it stand."

Dr. Cunningham, of England, said that when Dr. Cravens read his paper on the treatment of pulpless teeth, he had been accorded the privilege of setting before the section some statistics on the subject when his effects arrived. His practice being in a University town, among students who had not the time for repeated dressings and treatment, he was obliged to fill all classes of teeth at one sitting, rarely seeing the patient again. His practice with pulpless teeth was to remove the soft dentine, cleaning out the pulp-cham-

ber, but not the root-canals. When the cavity is ready for filling he places over the entrance to the canals a disk of paper saturated with creosote in which ten or fifteen grains of arsenic has been dissolved. Over this he fills with oxy-chloride and finishes the filling as desired. His success has been so great that he has confidence to assume and recommend this operation. Many of his cases he does not see again, but thinks he would have heard of them if they had been failures, and many others he has under observation that he knows are doing well. This method he calls "immediate root filling." When travelling on the continent recently, he visited the German school at Laepsic, and soon found that they wanted to communicate something which they considered the newest and best. It was "immediate root-filling," so named by Dr. Smith Dodge, but his own cases date back to 1883.

Dr. Cunningham then gave a long list of tabulated cases, statistics of failures and successes under different methods of treatment, with different remedies, etc., the conclusion being that the method described in the paper gave by far the largest percentage of successful operations, as far as heard from. He said that he was aware that the pathology of this treatment would occasion debate, but he offered the silent eloquence of facts, and was satisfied with the success. It gives less pain, consumes less time for both patient and operator, and earns the gratitude of the patient. Most of his cases are dismissed in less than half an hour. A broken drill he leaves with impunity, having yet to see the first case where it has caused trouble.

Dr. Kirk, of Indiana, said that seventeen years ago he had been called upon to fill a tooth with a dead pulp. It had to be filled immediately, as the patient was just starting for Kansas. As he never expected to see the man, he decided to do it empirically. He filled with oxy-chloride of zinc, and the patient left, satisfied. In three months he returned, and he begged him for three weeks, until he came to the office to thank him for the perfect satisfaction the tooth had given him, except for the first three days, when it gave him — he would not say what. On another occasion he put in, for a bootblack with a swelled face, as an experiment, a gold filling over oxy-chloride of zinc, and the record has been good.

He finds that he has less swelled faces than any one he knows who "treats" after the old methods. He cleans out thoroughly,

dries with alcohol and hot air, and fills to the apex with gutta-percha and oxy-chloride of zinc, without treatment. As a rule, a nerve canal that is large enough to be enlarged does not need enlarging; he would keep drills out of canals.

Dr. Ames, of Chicago, said he had been using this method for the past five years. Believes in removal of the contents of canals, thorough disinfecting and immediate filling. He decomposes the contents of the canals by electrolysis, flooding them with an acidulated fluid, using a platinum probe reaching to the apex in the canal. By the action of the current nascent oxygen is liberated, which combines with sulphuretted hydrogen and gives the disinfectant. Then with reamers he removes the contents.

Dr. Conrad, of St. Louis, had acquired confidence in this method by repeated trials and success. He uses peroxide of hydrogen.

Dr. A. E. Baldwin, of Chicago, had not heard Dr. Craven's paper, but he believed in "immediate root filling," even if there is a blind abscess; it can be brought to the surface and treated from the outside. He feared micro-organisms less than Dr. Barrett, and took exception to the statement that there could be no pus without their presence. He believed that more harm than good was done by a multiplicity of medicinal agents. He had been greatly interested in the statements made by the gentleman from England, and had the greatest respect for an open statement of honest opinion.

Dr. Sitherwood, of Bloomington, Ill., was much pleased with the paper read by the gentleman from England. It has been his practice for six years to fill at a single sitting. He believes that success depends on thorough cleansing and germicides.

Dr. Story, of Texas, said that a great variety of treatment had been advocated, but the treatment made but little difference provided the tooth was thoroughly cleaned out and nothing left to decompose. Provided he could get everything *out*, he did not care to get anything *in*. When there has been no pus, he does not care to fill the roots.

Dr. Stack, of Dublin, said he could add nothing to what had been said. In America the people are educated in the proper care of the teeth, and it is comparatively rare to find them so neglected as they usually are when they come under the hands of an English or an Irish dentist. The method advocated in the last paper read

seemed a great heresy, but it was supported by a strong array of facts and statistics. The practitioners of America could form no idea of the troubles they, across the water, had to encounter from such a different class of patients.

Dr. Cravens, in closing the discussion of his paper, thanked Dr. Fillebrown for the fair, gentlemanly and scholarly manner in which he had reviewed his paper. One or two points in the discussion demanded reply. He often found teeth that were too tender for him to attempt to touch them the first day, but by giving the patient instructions how to reduce the inflammation and modify the pain, he could then open the pulp cavity and operate with more satisfaction. He was not afraid of the bugaboo of septic conditions corked up. His use of the term "apical space" had been criticised, but the term was so fixed in dental nomenclature that it was easier to use it than displace it. It was true that he had "failed to mention impenetrable pulp canals," but he did not attempt to mention every possible case. Canals were often too slender to be filled with solids, but if they could be explored they could be filled with shellac on a hog's bristle, using the end out of the skin for the advance end, and leaving it in the canal permanently.

The objection was raised that he filled the roots of deciduous teeth with phosphate of lime, after saying that he used "no medicines." But the cook would indignantly deny having put "medicine" in the biscuits, though she had used salt and yeast powders, both medicinal agents in a certain sense.

The phosphate of lime is a powder, and easily shifted to meet the demands of the organ of absorption. He had chosen his subject after reading the monograph of the Odontological Society of Chicago. He was aware that its reading would be followed by a storm. Men who are eminent as therapeutists or embryologists don't like to see their temple razed to the level of ordinary exerts. But he asked only a fair trial for his method, with the warning that it requires courage to avow and to follow such a practice.

On motion, a committee of two was appointed to prepare a testimonial to Dr. N. S. Davis, as a mark of appreciation of his services in favor of dentistry.

A vote of thanks was tendered the President of the Section for the able manner in which he had presided over the meeting; overcoming so many obstacles in the most masterly way.

The vote was passed with long and loud applause.

Dr. Taft, in response, said that he appreciated the expression, but that he had fallen so far short of what should have been, that the resolution was unmerited. The credit for the measure of success attained was due, not to himself, but to the members in attendance. The final results were yet to be seen; great fruit must ripen from the seed just sown. Other sections have known but little of what was going on, but the impression is that it has been one of the best of the Congress. It has been unusually well attended. Even at that late hour, after all the other Sections have adjourned, 427 members are present; nearly as many at the last session, at half-past ten at night, as on any preceding occasion. That fact in itself speaks volumes. The effect will not be limited to the dental profession. The deliberations will be published in the transactions, and the physicians who were too busy in their own Sections to know what we were doing will then see the record we have made, and it will be there for us to study whenever we desire. In its social aspects, links have been forged that will not soon be broken. A chord of sympathy has been struck, and pleasant memories will go to our homes with us.

As the President was about to speak the words of adjournment, Dr. Cunningham interrupted him with a resolution of thanks to the Secretaries for their faithful service, and also to the Executive Committee, which had done wonders.

The rooms which had been secured were admirably adapted to the necessities of the occasion. The Franklin School building, in which had been held the clinics, was especially commodious and convenient. There were so many rooms upon the different floors, they were so large and airy, and the light was so ample, that it was difficult to see how better accommodations could have been found. Great credit was due to all the local as well as to the general committees, and Drs. R. F. Hunt, H. B. Noble, M. F. Finley, R. B. Donaldson, Ed. Maynard and D. McFarlan had been untiring in their devotion to the section. Their reward would be in the consciousness of the unqualified approval of all who had been in attendance.

Passed unanimously.

The Section of Oral and Dental Surgery then adjourned, and the Ninth International Medical Congress became a thing of the past.

(A report of the Clinics will be given in the next number.—EDITOR)

Editorial.

MOUTHWASHES.

Dr. Miller, in his article upon mouthwashes in this number, calls attention to the fact that the expected results from the late advancement in the knowledge of bacteriological science have not been attained. Practically, we are but little better off than before the investigations of the past few years were made. Yet no one will be so foolish as to declare that they have therefore been in vain, and that the efforts were a waste of time. Definite scientific knowledge must first be obtained, and the laws which dominate conditions must be studied and determined. Their application and the control of conditions must be learned by clinical observation and objective study. When Laplace pointed out that the harmony of our solar system demanded the existence of another planet between the orbits of Mars and Jupiter, the telescopes of the world were at once pointed at the vacant space, with the consequence of the discovery of what was, perhaps, the fragments of a disrupted planet, and the observations were continued until nearly one hundred and fifty Asteroids were added to the solar system. In like manner, now that Dr. Miller has pointed out the probable true factor in dental caries, others will assist in the practical application of these observations.

The observant reader will be impressed by the results of Dr. Miller's late experiments. Some drugs from which he would naturally expect excellent results have proved quite barren, while others are but partially successful. Bichloride of mercury is the only agent which he has found absolutely reliable, and of this most practitioners will stand somewhat in fear because of its toxicological properties. Listerine seems to have been fairly efficacious, and is viewed with favor by Dr. Miller. If the sublimate be an essential, why might not listerine be employed as the base, the dentist making a prescription in which listerine and water should be used to form, say a two per cent. solution of mercuric bichloride? We have prescribed pure listerine as a mouthwash in cases of extremely dental caries, and with excellent results. In fact, it is the only antiseptic mouthwash that we have felt called upon to prescribe.

We are sure that good results might be attained if intelligent dentists would enter upon a systematic course of experiments with

the formulas suggested by Dr. Miller, and with others which their experience might suggest. But mere empirical trials will not answer. The action of any given formula must be tried, not only in the mouth, but in carefully conducted experiments upon artificial cultivations, that results in practical cases may be verified by scientific investigations. We are certain that all such collaboration will be warmly welcomed by Dr. Miller, and we shall be very glad to publish the results in this journal.

THE TRIUMPH OF LAW.

The Indiana State Dental enactment has been fully sustained in a case which was finally adjudicated upon by the Supreme Court of the State. The law is a very good one, its provisions not materially differing from that of some other States. A Board of Examiners is appointed, before whom applicants for registration under the law must appear for the determination of the legality of their diplomas, or for examination as to their qualifications to practice dentistry in the State. Section 3, which was especially applicable in the defendant's case, reads as follows:

Any person who shall prove to the satisfaction of said Board of Examiners that he is a graduate of a Dental College duly and legally incorporated, and who shall present a diploma therefrom, and shall further show that said college is of good repute, shall be entitled to a registration certificate on the payment of a fee of one dollar to said board.

One George Wilkins, of Marion, Grant County, presented a diploma from the disreputable Delavan, Wis., institution. He was refused registration, but continued practice. Suit was brought against him, and the case was tried in the Circuit Court, the law being held constitutional, and the defendant found guilty and fined. He appealed, and the case was tried before the Supreme Court, a decision being made March 2, 1888. The act was again found constitutional, and the decision of the lower court sustained. Dr. Milton H. Chappell, the Secretary of the Board, has sent us a summary of the opinion of the judges as rendered in the decision, and it is of so much interest to the dentists of all sections, as indicating the reasoning of competent jurists upon the claims of dentistry to legal recognition, that we shall try to present it in another number. It is, much to our regret, crowded out of this one.

TO WHOM IT MAY CONCERN.

We are in receipt of letters from a number of dentists who enquire about "The Porcelain Dental Art Company," of Detroit, and say that our name has been published as a licensee of the company. We desire to make this public answer to save the necessity for personal communications.

For some years we have been using one of Dr. Land's Gas Furnaces, for baking continuous gum work and for other laboratory purposes, and always with increasing satisfaction. We believe that it will do quite as good work as any of the coke furnaces, and at a great saving of time and trouble. This furnace was bought long anterior to the formation of any company for its control, and entirely without stipulations.

Of "The Porcelain Dental Art Company" we have no knowledge whatever, and have never had dealings with it in any manner. We have no license for the use of patented privileges of any kind, and want none. We have never given authority for the use of our name in connection with any system of licenses, and most decidedly disapprove of all such methods among those who call themselves professional men. If we cannot use our gas furnace without a special license, we shall most certainly lay it aside henceforth and forever.

CROWDED OUT.

In consequence of the great amount of matter for the "Current News" department that came in at the last moment, some of the editorials, which were all in type, have been obliged to give way. The leading one, on "Anæsthesia and Anæsthetics," was the first to be superseded, and some shorter ones took their place with it upon the standing galley. They will perhaps keep a month, and if not, they can very well be spared altogether.

CHANGE OF ADDRESS.

The New York office of this journal has been changed from No. 35 West 46th Street to No. 33 West 47th Street. It is simply a change for convenience. Business letters should be addressed to the Buffalo office.

Current News and Opinion.

Editor Independent Practitioner :—

Seeing an interesting article in the INDEPENDENT PRACTITIONER a short time ago, by Dr. L. P. Haskell, concerning vulcanite and its effects, allow me to quote two interesting cases coming under my care, and which I still keep track of.

CASE 1. Lady of middle age, wearing a full upper and under set on red vulcanite. After wearing for about three months, a puffiness of the mucus membrane of the mouth, sour stomach and looseness of the bowels were present. The latter trouble increased greatly, and at the end of eight months evacuations from the number of fifteen to twenty a day were not uncommon. Such effects followed as to produce alarm, and being a college student at the time, and under Dr. Haskell's instructions, his ideas were followed out. A gold upper denture with rubber (brown) attachments, and a Watts metal lower denture were made, with the result of a rapid gain from the first week, and to-day the patient is well and strong.

CASE 2. Was similar, though the mucus membrane of the mouth was not so much involved, but the bowel trouble about the same. Metal plates were made as in case one, and as a result a perfect cure was effected.

Were these cases merely coincident, or due to a specific cause? When will we follow the teachings of experience and wisdom as given to us by one so capable as Dr. Haskell?

H. L. BARNUM, M. D.

Editor Independent Practitioner :—

My attention has been attracted to a description in the March number of the INDEPENDENT PRACTITIONER of "A New and Simple Matrix," as suggested by Dr. Samuel B. Freeman, of Chicago, Illinois, and while I do not wish to question that the device is entirely original, so far as Dr. Freeman is concerned, I do feel it is but justice to say that this form of matrix was conceived and devised by me several years ago, and exhibited before a meeting of the Susquehannah Dental Association, held at Lock Haven, Pa., in May, 1886, to which fact such well-known practitioners as Dr. C. S. Beck, of Wilkesbarre, Dr. G. W. Klump, of Williamsport, and others can testify. To further convince you of this claim, I herewith enclose one of these matrices, which was made by me and has been in use since 1886, the only difference being that my matrices have been made of thin steel and phosphor-bronze. This form of matrix was also exhibited by me before the Pennsylvania State Dental Society, held at Cresson Springs, Pa., in July, 1886.

WM. B. MILLER, D. D. S.,

Altoona, Pa.

Editor Independent Practitioner :—

In the report of the Ninth International Medical Congress, published in your journal for February, 1888, I notice on page 83, that Dr. Busch, Director of the Dental Institute of the Royal University of Berlin, exhibited some circular knives as his invention. As I invented circular knives twelve years ago, and

after using them for a number of years, published a note on them in the *Boston Medical and Surgical Journal* for May 31, 1883. It is difficult to see how Dr. Busch can rightly claim them as original, except in the way that Dr. Lund has appropriated my investigations of gas furnaces and enamel fittings, published many years ago.

W. H. ROLLINS,

250 Marlborough St., Boston, Mass.

THE INFLUENCE OF PERIOSTEUM IN THE FORMATION AND REPAIR OF BONE.

Dr. William McKuen of Glasgow, who is regarded as an authority, not only in Great Britain but upon the continents of Europe and America, a surgeon of vast clinical experience, contributes to *Annals of Surgery* a valuable paper upon this subject. It consists of a series of propositions supported by many convincing cases. The periosteum has usually been considered the active agent in the reproduction of bone, the medulla also being capable of the same function. The author contends that the periosteum is not the prime factor in bone regeneration, but that the soft tissues enclosed in the bone play the most important part in its development and reproduction. He admits the importance of maintaining the close relationship of the bone and the vascular periosteum, but argues that when it is temporarily separated from the bone, or when a part of the bone is entirely denuded of its periosteum, it is still supplied with enough of blood from the interior to maintain its vitality for an indefinite period, or until the formation of a new periosteum. His propositions are as follows:

Proposition A. When periosteum has been detached from an extensive area of an adult, healthy bone, and replaced after the lapse of some hours, union between the bone and periosteum can take place without sloughing or observable augmentation ensuing.

Proposition B. The periosteum may be separated from the bone for a period of days by inflammatory products, after the withdrawal of which reunion between the bone and the periosteum may take place without necrosis ensuing, showing that the temporary separation of the periosteum, even as a pathological result, is not necessarily attended by death of the bone.

Proposition C. The periosteum covering a portion of bone may be completely destroyed or permanently removed, yet the denuded bone may not only retain its vitality, but may throw out cells which will cover it and form a new periosteum.

Proposition D. A portion of bone which has its continuity secured on all sides, and at the same time has had all its periosteum removed, is capable of living and growing.

Proposition E. Not only do detached portions of bone deprived of their periosteum live when reimplanted in their original position, but such portions are capable of living after transplantation. Parts of deeper layers of bone which have no periosteal connection have lived and grown.

Proposition F. The periosteum does not initiate the reproduction of bone.

Proposition G. Bone may be regenerated independently of the medulla, which may itself be reproduced.

Proposition H. The histo-genetic phenomena support the foregoing observations, showing that periosteum does not generate bone.

The author shows that bone is reproduced from the osteoblasts, which are found in the interior of bone, in the intermediate tissues, in the Haversian canals, and under some circumstances in the central cavity. The periosteum acts merely as a sheath, as a protecting limiting membrane through which the bone receives a part of its blood supply, the more important part being provided by the nutrient vessels of the bone itself. In the light of these propositions, the successful implantation of teeth may be readily accounted for, the presence of the desiccated pericemental membrane not being essential, and serving only as a kind of sponge-graft in the meshes of which the first deposits are protected. The connection of the implanted tooth will not probably be through a pericemental membrane, but by a direct bony union, more or less perfect.

ILLINOIS STATE DENTAL SOCIETY.

The twenty-fourth annual meeting will be held at Cairo, commencing Tuesday, May 8th, 1888, continuing four days.

REPORTS, ESSAYS AND DISCUSSIONS.

Report of Committee on Dental Science and Literature, Dr. M. L. Hanaford, Rockford, Chairman.

Report of Committee on Dental Art and Inventions, Dr. W. T. Magill, Rock Island, Chairman.

Dental Morphology and the Etiology of Irregularities, Dr. John J. R. Patrick, Belleville. Discussion opened by Dr. E. H. Angle, Minneapolis, Minn.

Dental Electrics, Dr. J. Rollo Knapp, New Orleans. Discussion opened by Dr. G. W. Whitfield, Evanston.

Some Main Points Touching the Conservative Treatment of Teeth Whose Pulps are Nearly or Quite Exposed, Dr. J. D. Moody, Mendota. Discussion opened by Dr. J. N. Crouse, Chicago.

What shall we do with Inflamed Pulps? Dr. W. A. Johnston, Peoria. Discussion opened by Dr. A. W. Harlan, Chicago.

Prosthetic Dentistry. Some Difficult Cases and their Treatment, Dr. L. P. Haskell, Chicago. Discussion opened by Dr. Edgar D. Swain, Chicago.

The Rationale of Constructing and Attaching Artificial Crowns to Natural Roots of Teeth, Dr. John J. R. Patrick, Belleville. Discussion opened by Dr. Henry J. McKellops, St. Louis.

Making and Tempering Instruments, Dr. J. Frank Marriner, Ottawa. Discussion opened by Dr. George H. Cushing, Chicago.

Amalgams, Dr. W. B. Ames, Chicago. Discussion opened by Charles R. Taylor, Streator.

CLINICS—WEDNESDAY.

Dr. Truman W. Brophy, Chicago. Approximal Gold Filling, Molar or Bicuspids, using his Continuous Band Matrix.

Dr. W. N. Morrison, St. Louis. Regulating Appliances, Jack Screws Secured by Thin Platinum Bands, Springs, Wedges, etc.

Dr. E. H. Angle, Minneapolis, will have Models and Appliances Representing his new Methods of Regulating.

Dr. John J. R. Patrick, Belleville. The means he uses for Regulating Teeth will be shown by Charts and a Large Model with Movable Teeth.

Dr. C. A. Kitchen, Rockford. Tin and Gold Filling.

Dr. T. L. Gilmer, Quincy. Telescopic Platinum and Gold Cases.

Dr. J. Austin Dunn, Chicago. Medicated Syringes.

Dr. James W. Corman, Mt. Carroll. Gold Filling, using Electric Mallet.

Dr. A. E. Matteson, Chicago. Odds and Ends of Office Practice.

Dr. D. B. Freeman, Chicago. Labio Cervical Filling, using his Double Loop Clamp.

Dr. W. H. Taggart, Freeport. Corundum Point and Disk Maker.

THURSDAY.

Dr. J. Rollo Knapp, New Orleans, will have a very interesting Clinic on Crown and Bridge work.

Dr. A. W. Harlan, Chicago. Pyorrhea Alveolaris; Etiology, Progress and Treatment.

Dr. John J. R. Patrick, Belleville, will make and mount a Gold Crown for a member, and will have his Gold Crown Apparatus and Outfit Complete.

Dr. J. G. Reid, Chicago. Tin and Gold Approximal Filling.

Dr. H. H. Townsend, Pontiac. Approximal Gold Filling.

Dr. E. A. Wooley, Chicago. Root Canal Dryer.

Dr. K. B. Davis, Springfield. Gold Filling.

Dr. G. W. Whitfield, Evanston, will demonstrate Electrical Conditions Caused by Different Metals used in Filling Teeth.

Dr. E. D. Swain, Chicago. Gold Filling, Approximal.

Dr. C. N. Pruyn, Chicago. Cocaine in Minor Surgery and Extracting.

RAILROAD RATES.

Satisfactory rates have been obtained on all roads on the certificate plan. On the certificate plan the passenger pays full fare in going to the meeting, and secures his certificate thereof of the agent by requesting same at the time of purchase, and this certificate, when countersigned by the proper officials at the meeting, becomes authority for the sale of a return ticket over the same road between the same points at one-third fare, thus making one fare and one-third for the round trip.

HOTEL RATES.

Halliday House.....	\$5.00 to \$8.00
European.....	1.50
Arlington.....	1.50
Waverly.....	1.00

The State Board of Dental Examiners will be at the Halliday House on Monday, May 7th at 10 A. M. All candidates for examinations must be present at that hour. Examinations will last three days. (C. R. H. Kern, Secy.)

CONNECTICUT VALLEY DENTAL SOCIETY AND MASSACHUSETTS DENTAL SOCIETY.

The Connecticut Valley Dental Society and the Massachusetts Dental Society will hold a Union Meeting in Boston on the 10th, 11th, 12th and 13th of July next, at the Institute of Technology. All the Dental Societies in New England will be invited to unite with them, so that the meeting promises to be the largest ever held in this part of the country. The programmes will be sent out by the last of June. The work of the meeting will consist of essays, clinics and demonstrations in Dental Technics, and the presentation of inventions and improvements by members of the profession. Essays and papers will be given on subjects of practical and theoretical importance. Clinics will be given by prominent members of the profession. Clinics will in all cases be limited to actual operations with the patient in the chair. Under Dental Technics, will be shown methods of manipulation—processes not requiring the presence of patients—preparation of materials and making of instruments by members of the profession. The size of the meeting will offer a good opportunity to present appliances or new inventions. Those at a distance can send such with a brief description, and members will be appointed to present them at the meeting.

A full report of the meeting will be published in the professional journals. Members of the profession and journals are requested to kindly extend this notice as far as possible. Those having matters of interest under any of the above heads are invited to bring them to the attention of the Secretaries of the different committees, as given below. In connection with the meeting will be held an EXHIBITION modeled after the "Medical and Surgical Exhibition of the International Medical Congress." Recognizing the connection of the dental profession with the arts and sciences, all persons having articles, instruments or materials for use in dentistry, or that can be made of use in any way, are cordially invited to exhibit them. A large hall will be used for this purpose, and no charge will be made for space. It will, however, be necessary for exhibitors who desire to show apparatus requiring water or gas, to make their own arrangements with the janitor or treasurer of the hall. The exhibition of motors will be a prominent feature. The name and address of the exhibitors, with one line, descriptive of their exhibits, will be printed on the programme. Members of the profession knowing of manufacturers or dealers in new or interesting articles, are requested to send notice to the Secretary of Committee on Exhibits.

Secretary of Committee on Essays,	Secretary of Committee on Clinics,
Dr. A. H. Gilson, 10 Temple Pl., Boston.	Dr. E. C. Leach, 422 Col. Ave., Boston.
Secretary of Committee on Exhibits,	Secretary of Committee on Motors,
Dr. W. E. Page, Studio B'ld'g, Boston.	Dr. S. G. Stevens, Evans House, Boston.

Please reserve the above dates on your appointment book.

G. F. Eames, M. D., D. D. S.,	Geo. A. Maxfield, D. D. S.,
62 Trinity Terrace, Boston, Mass.,	Holyoke Mass.,
Secretary Mass. Dental Society.	Secretary Conn. Val. Dent'l Soc.

NEW YORK COLLEGE OF DENTISTRY.

The twenty-second annual commencement of the New York College of Dentistry was held Saturday evening, March 19th, at Chickering Hall. Vice President, Dr. Wm. T. LaRoché, presided. Valedictory address by Albert Wycklake, Jr. Address to graduates by the Rev. Thomas Gallant, D. D.

Number of matriculates for the year, 211. Number receiving the degree of Doctor of Dental Surgery, 72, as follows:

GRADUATES.

Franklin Porfirio Arango, N. Y.	William Fletcher Austin, Conn.
Vincent Washington Baker, N. J.	Winfield Hart Baldwin, Ill.
Charles Leslie Babcock, Ill.	Virgilio Basso, Cuba.
Jacob Bate, Eng.	Stephen Edward Best, N. Y.
Herman Tobias Braun, Fla.	John L. Crater, N. J.
Francis Anthony Chicherio, N. Y.	Julian Hyde Clark, N. Y.
Johannes Friedrich Wilhelm Clasing, Ger.	Jose Angelino Arvelo De Casas, Cuba.
Joaquim Rodriguez Da Silva, Demerara, B. G.	William Lewis Drummond, N. Y.
William Billings Drake Davenport, Mass.	Frank Morseman Dunn, N. Y.
William Salsbery Depew, N. Y.	Frederick Hubert Edmonds, N. J.
David Nathan Feigensohn, Russia.	Edward Fox, Ireland.
Edward Beardsley Griffith, Conn.	Walter Ephraim Geyraud, Mass.
John Conrad Graft, N. J.	Karl Ferdinand Alfred Hans, Ger.
Fred Miner Hayward, Vt.	George Duck Herbert, N. J.
Jacob Hassinger, N. Y.	Elias Scudder Hall, N. J.
William Philip Ives, Conn.	Henry Arthur King, Can.
Edward Max Kettig, Ky.	Dennis Frank Kato, Mass.
Isaac Lyon, N. Y.	Charles Melzar Lindsay, Cal.
Cortez Jefferson Mapp, Ga.	Simon Theodor Alfons Muller, Ger.
Charles Everett Maine, Conn.	Frederick Louis Marshall, N. Y.
Nelson Merwin, N. Y.	Eugene Walton Marshall, N. Y.
Vincent Maurice Munier, N. Y.	Louis Philippe Margross, France.
Henry John Moore, Eng.	John James Marchant, Bevel.
Hornace Wilson Northrop, Conn.	Frederick Nies, N. Y.
Albert Brown Osman, N. J.	William Henton Pyden, N. J.
Charles Albert Pickhardt, Conn.	Edward Stevens Rugg, N. Y.
Herman T. H. Russell Nassau, N. P.	Daniel Barclay Smith, N. J.
Arthur Percy Storridge, Jamaica, W. I.	William Henry Sweeney, N. B.
Clarence Boice Stelle, N. J.	Leon Andrew Smith, N. Y.
John Scott Sanger, N. Y.	Charles Simon Smoot, Ill.
Lewis Mapes Slocum, Jr., N. Y.	Livingston Andrew Snyder, Penn.
Edmund Louis Stevens, N. Y.	William James Taylor, N. Y.
Willard Forrest Tooker, N. Y.	Frank Van Blarcom, N. J.
Charles Frederick Weber, N. Y.	Ernest Ford Wood, N. Y.
Harry Prescott Wilcox, Conn.	Albert Washlake, Jr., N. J.
Alfred Wagner, N. Y.	Charles Dutton Wright, Can.

OHIO COLLEGE OF DENTAL SURGERY.

The Forty-second Annual Commencement of the Ohio College of Dental Surgery (Dental Department of the University of Cincinnati), was held at College Hall, Cincinnati, Ohio, Wednesday, March 7, 1888.

GRADUATES :

D. S. Anderson.....	Ohio.	Edwin Waddel....	Ohio.
H. J. Bosart.....	"	W. W. Wallace.....	"
E. D. Broadwell.....	"	N. B. Hartwell.....	Indiana.
H. W. Cleland.....	"	M. A. Menges.....	"
D. M. Clement.....	"	B. C. Reid.....	"
Mrs. Jessie Dillon.....	"	E. J. Ward.....	"
M. H. Evans.....	"	J. W. Cartmell.....	Kentucky.
A. B. Fletcher.....	"	C. B. Clark.....	"
H. E. Harlan.....	"	J. F. Rees.....	"
F. Y. Herbert.....	"	W. C. Shankland....	"
J. W. Hillman.....	"	O. T. Hanson.....	Illinois.
E. D. Hinkley.....	"	O. S. Mills ..	"
C. B. Hussey.....	"	A. H. Rainey.....	"
I. F. Hussey....	"	B. L. Shobe.....	Kansas.
C. G. Lockwood ..	"	R. H. Updegraff.....	"
H. H. Robinson.....	"	J. A. Henning.....	Missouri.
C. A. Schuchardt.....	"	W. E. Scott....	"
J. B. Schunck....	"	W. E. Gochenour.....	Wisconsin.
H. T. Smith.....	"	R. D. Rood.....	"
Mrs. Z. V. Swift.....	"	W. A. Windell.....	Canada.
T. D. St. John.....	"	J. F. Hardman ..	Iowa
J. P. Tudor.....	"	R. B. Foster.....	Minnesota.
S. M. Ulrey.....	"	T. H. Sexton.....	Pennsylvania.

MINNESOTA HOSPITAL COLLEGE.

The Seventh Annual Commencement of the Dental Department of the Minnesota Hospital College was held in conjunction with the Medical Department, in the Hennepin Avenue M. E. Church, on Friday, March 16, 1888.

The address was delivered to the graduates by the Rev. Dr. D. J. Burrell, and the valedictory on behalf of the class by C. D. Snow, D. D. S.

The number of matriculates for the session was thirty-eight.

The degree of Doctor of Dental Surgery was conferred on the following graduates by C. H. Hunter, A. M., M. D., President of the Faculty :

H. G. Dampier.....	Minnesota.
A. N. Cheney.....	Minnesota.
C. D. Snow.....	Minnesota.
H. T. Burnette.....	Minnesota.
C. L. Sargent.....	Wisconsin.
D. H. Carpenter.....	Minnesota.
A. H. Benson, M. D.....	Wisconsin.
J. D. Jewett.....	Minnesota.

KANSAS CITY MEDICAL AND DENTAL COLLEGE.

The commencement exercises were held in Music Hall, Kansas City, Tuesday, March 13, 1888. The following graduates in dentistry received their diplomas: R. V. Anderson, J. L. Leavel, F. L. Murslock, J. L. Rucier, W. L. Root, H. S. Smith, E. S. Sweet, C. M. Tindall.

FIFTH DISTRICT DENTAL SOCIETY.

The Fifth District Dental Society of the State of New York will hold its twentieth annual meeting at Utica, Tuesday and Wednesday, April 10th and 11th, 1888. The session will be called to order at 2 P. M., at the Fairbairn House. Applications for membership in the Society should be made prior to the day of meeting, to the Chairman of the Board of Censors, or to the Recording Secretary. The Board of Censors will be in attendance to examine candidates for admission to the Society. Members of the profession from other societies are cordially invited to be present and take part in the discussions.

C. J. PETERS, Syracuse, *Rec. Sec.*

SEVENTH DISTRICT DENTAL SOCIETY.

The twentieth annual convention will be held in Rochester, N. Y., April 24th and 25th. This Society includes the counties of Monroe, Wayne, Caroga, Seneca, Yates, Ontario, Livingston and Steuben. Dentists practicing in any of these counties, and who wish to become members of the Society, can obtain information regarding requirements for membership, by writing to the Recording Secretary.

The convention will be made as interesting as possible. Members of the profession are invited to be present.

CHAS. T. HOWLAND,

224 E. Main St., Rochester, N. Y.

Recording Secretary.

EIGHTH DISTRICT DENTAL SOCIETY.

The twentieth annual meeting will be held in the lecture room of the Society of Natural Sciences, Library Building, in the City of Buffalo, on Tuesday and Wednesday, April 17 and 18, 1888. All practicing dentists are cordially invited to be present.

S. A. FRIEDMAN, *Secretary.*

SOUTHERN ILLINOIS DENTAL SOCIETY.

The Southern Illinois Dental Society will hold its second annual meeting at Sadler's Opera House, Centralia, Ill., commencing Tuesday, April 10, 1888, at 10 A. M. Clinics will be a prominent feature of the programme. Papers and addresses by well known dentists will be presented, and it is expected that an unusually profitable meeting will result.

G. W. FORTMILLER, *Secretary.*

C. B. Rohland,
T. W. Pritchett,
A. D. Finch,

Ex. Committee.

TEXAS DENTAL ASSOCIATION.

The next meeting of the Texas Dental Association will be held in Dallas, Tex., commencing on the first Tuesday in May, and continuing for four days.

T. H. LAWSON, H. H. W. (Pres. and Sec.).

ILLINOIS STATE BOARD OF DENTAL EXAMINERS.

A meeting of the Board will be held at the St. Charles Hotel, Cairo, Ill., on Monday, the 14th day of May, at 11 o'clock A. M., and continue in session for three days. All parties desiring to obtain license to practice in this State, or having other business that requires the action of the Board, will please govern themselves accordingly.

CHARLES R. E. KOCH, Secretary.

KANSAS STATE DENTAL ASSOCIATION.

The seventeenth annual meeting will be held at Topeka, commencing Tuesday, April 24, 1888, and will continue four days. An unusually attractive programme will be presented, and it is expected that several gentlemen of prominence from abroad will be present and address the meeting.

C. B. GUNN, Secretary.

GANGRENOUS TOOTH PULPS.

Dr. W. D. Miller contributed to the Mississippi Valley Dental Association a paper on "Gangrenous Tooth Pulps as Centers of Infection." The paper does not pretend to present the subject as complete, the experiments being but little more than begun.

A tooth containing a gangrenous or putrefying pulp was extracted, mechanically cleaned and then brought for a moment into $\frac{5}{1000}$ solution of bichloride of mercury. It was rinsed with sterilized water to remove the sublimate, split with sterilized forceps and the putrid pulp removed with a sterilized needle. The material was then used to inoculate mice subcutaneously. One hundred and eighteen infections had been made, in a great majority of the cases followed by inflammation and swelling within twenty-four hours. At the end of the second or third day an abscess was usually found, containing pus densely impregnated with micro-organisms; some of the pulps developed more violent symptoms than others. In one case, at the end of the second day, a tumor developed containing a considerable quantity of fetid pus, with gases. A second mouse was inoculated with this pus, and a third from this one, and so on to the twelfth inoculation, each exhibiting the same characteristics, when the mouse died and ended the experiments.

In some cases there was blood poisoning. From these experiments, Dr. Miller believes that a putrid tooth-pulp may be a center of infection, or it may serve as a channel through which pathogenic bacteria from the oral cavity may invade the tissues surrounding the point of the root, or even obtain entrance into the circulation.

CORRECTION.

In my work "Irregularities of the Teeth," on pages 157 and 158, certain retaining appliances are spoken of as having been devised by Dr. Magill. Since the publication of the book the author has discovered that he was in error, and that the retainers referred to were designed by Dr. Guilford, and should have been credited to him.

EUGENE S. TALBOT.

THE FOLLOWING is a statement of the number of medical students attending the fifteen medical schools which existed in the United States in 1829:

University of Pennsylvania	480
College of Physicians and Surgeons of New York	186
Harvard College	120
Dartmouth College	80
University of Maryland	215
College of Physicians and Surgeons of the Western Dist. State of New York	120
Yale College	82
Medical College of Ohio	87
Vermont Academy of Medicine	184
Transylvania University	215
Medical School of Maine	60
Brown University	48
University of Vermont	42
Berkshire Medical School	94
Medical College of South Carolina	50
Total	1079

—*Lancet & Times*.

THE MEDICAL AND SURGICAL REPORTER quotes from *The Dentist* as follows: In cases of catarrh of the antrum, Dr. Schiffrers, of Liège, instead of extracting the second molar, gains access to the cavity through the opening in the middle mentus of the nose. Through this he inserts a director, and with the help of a curved, probe pointed bistoury, he opens up a passage for the free exit of the confined secretion. By the use of cocaine the patient suffers but little during the operation. Dr. Schiffrers points out that catarrh of the antrum is frequently overlooked and mistaken for an affection of the mucous membrane of the nose. When an abundant fetid discharge runs from the nose, especially if it is intermittent, the existence of disease of the antrum should be suspected; a careful search should then be made, with the help of the nasal speculum and a good light, for the welling up of the secretion through the foramen in the middle mentus.

WE INCIDENTALLY CRITICISED the grammatical construction of the following sentence, found in *The Western Dental Journal*:

"The school boy essayists are catching fits, and right they should"—whereupon the "Miscellany" editor makes this rejoinder:

"Does the editor of the INDEPENDENT PRACTITIONER intend to pass before the profession as one of the 'literate,' or is he going to abandon dentistry for the broader field of inculcating correct grammar and pure English?"

We are not "posing" at all, Deah Bay—we are not a power, but do you not think that an idea may be quite as well expressed in good English as in bad, or do you believe that a knowledge of grammar is incompatible with the practice of dentistry? And while you do have your hand to, pray will you not analyze the phrase, "A field of inculcating?"

"IF YOU WANT SOMETHING PLEASANT to think of when you're in a dentist's chair, and he is fishing down into the root of one of your teeth for the end of a nerve, think of this; that it is only a few years since the only dentists were the regular physicians, and all they knew about dentistry was to throw a hideous kind of a steel grappling hook around a tooth and then haul away until something came. Now a dentist has to be a thorough chemist, a practical metallurgist, a good physician, an anatomist, a surgeon, a vulcanized rubber worker, to some extent an electrician, and have some feeling for the suffering of the people who come under his care. That's the way dental science has developed in a quarter of a century."—*New York Commercial Advertiser*.

THE ANNALS OF SURGERY, which has just entered upon its fourth year, under the editorial management of Dr. L. S. Pilcher, of Brooklyn, and Dr C. B. Keetley, of London, Eng., is the only periodical in the English language that is devoted exclusively to surgery. All other departments of medicine are represented by a number of journals, but surgery has this alone, and we are not sure that it needs another. Each number contains a great variety of matter—exclusively original articles, editorials and summaries of surgical progress. *Annals of Surgery* is published monthly by J. H. Chambers, of St. Louis, at five dollars per annum. We can most heartily commend it to every one who has any interest whatever in surgical practice.

DR. A. O. HUNT, of Iowa City, met with a painful accident lately, by falling and dislocating his shoulder. Pearson condoles with him, and says that it was perfectly right and proper that a man occupying his position should choose the time and place when he wishes to have his anatomy demoralized, for in these times of College Commencements and other riotous proceedings, a man is liable to *fall* in the most unexpected and inconvenient places, and have his bony structure handled by outsiders who do not know a clavicle from a cocktail, nor which to put in place first. But when the fall occurs amid home influences, his friends are spared the disagreeable task of explaining how the banana peel happened to be there.

THE BRITISH MEDICAL JOURNAL for November 12, 1887, contains a paper by J. Hutchinson, Jr., upon the teeth in inherited syphilis. *Archives of Pediatrics* says that the whole subject is very carefully gone over. It was pointed out to be a fallacy to look for characteristic signs in the temporary teeth. They are, however, liable to premature decay and falling out. Of the permanent teeth, those first ossified—the incisors and the first molars—were the ones which showed to the greatest degree syphilitic deformity, the upper central incisors being the "test-teeth." Many syphilitic children have teeth normally formed.

DR. A. W. HARLAN, of Chicago, read a paper before the Odontological Society of Great Britain, at its February meeting upon "The Management of Pulpless Teeth from the Standpoint of Daily Practice." At the same meeting Mr. Bland Sutton, F. R. C. S., read a paper upon "A Remarkable Case of Odontomes in a Thar, (Himalayan Goat.)"

Dr. W. STOKER HOW, in a paper read before the Mississippi Valley Dental Association, asserts that the great progress of American dentistry has been largely due to dental patents.

Ah, indeed! Of course the more important the patent and the greater its influence upon dentists and dentistry, the more has it contributed to this wonderful advance. Shall we then elevate Josiah Bacon and Dr. Sheffield to a position as the patron saints of dentistry, dethroning Harris, Farrelly, Bond, Brown and their compeers, as the opponents of progress, because they did not advocate patents?

Dr. J. AUSTIN DUNN has made a decided improvement in the needles of hypodermic syringes, and one which is especially adapted to the points of his medicinal syringe. Instead of soldering them to the hub, they are, by means of a rubber washer, adjusted as a nerve branch is adjusted in a screw holder. If the needle becomes stopped, it can easily be removed and heated without danger of unsoldering, or it may be thrown aside and a new piece of hollow wire inserted in its place. We do not see how the Dunn Syringe could be further improved.

"A CHRISTIAN SCIENCE" professor in Chicago tried for seven days to cure an alveolar abscess, but the lady's face continuing to swell and the pain growing more severe, she resorted to a dentist who relieved the ache by extracting a molar. Seven dollars were willingly paid the scientist for humbugging, and the fifty cents charge of the dentist was grumbled at.—*Medical Standard*.

GENERAL A. W. GREELY, Chief Signal Officer of the United States, contributes to the April *Scribner's* a valuable and timely article, answering the question "Where Shall We Spend Our Summer?" He gives some pertinent advice as to the best time for taking a short vacation, and explains the conditions of climate which make some resorts preferable to others.

A BRASS OR COPPER SURFACE, as a door plate or bell, may be silver-plated by rubbing with a soft piece of leather covered with the following preparation. One part of chloride of silver, three parts pearl ash, one and one-half parts common salt, and one part whiting. After the plating the metal should be washed with a weak solution of soda and wiped dry.

Dr. DRESCH, of Foix, France, says that the following method causes an immediate cessation of hicough. The sufferer should close his external auditory canals by inserting a finger in each ear, exerting a certain degree of pressure; at the same time he should drink a few sips of any liquid, the glass or cup being held to his lips by another person.

THE GREAT TELESCOPE of the Lick observatory, in California, has been mounted upon a hollow iron pier thirty feet high. So marvellous is the magnifying power that the placing of a man's hand upon the iron pier causes expansion sufficient to throw a star entirely out of the field. The pier will have to be changed.

THE AMERICAN MEDICAL ASSOCIATION will hold its thirty-ninth annual session in Cincinnati, Ohio, on Tuesday, Wednesday, Thursday and Friday, May 8, 9, 10 and 11, 1888, commencing Tuesday at 11 A. M. Dr. J. Taft is chairman, and Dr. E. S. Talbot Secretary of the Section of Oral and Dental Surgery.

TALMAGE advertises for a text for his sermon before the dental convention. How about "The noise of the grinders is low"?—*Med. and Surg. Reporter*.

Where may that text be found? It certainly is not in the Bible. The old, shop-worn, back-number jest is not on the dentist this time.

THE CLIMATOLOGIST is the name of a new quarterly journal published in Washington and devoted, as its name indicates, to climatotherapy, epidemiology and preventive medicine. The first number is very attractive, and the journal gives promise of an abundant success.

DR. FORDYCE BARKER says that cancer is a disease of the most highly civilized, the most cultured, the worthy, and of localities that are the most salubrious, and that it is not hereditary.

Well, that opinion is consolatory, at least

MARRIED.—In New York City, February 21, 1888, Dr. Sebert E. Davenport to Blanche Stevens. The happy parties will please accept the congratulations of THE INDEPENDENT PRACTITIONER.

OIL STAINS may be removed from marble by applying common clay saturated with benzine. If the oil has remained long enough it may have removed the polish, but the stain will disappear.

LAMBERT'S LISTERINE is one of the most perfect solvents for tannic acid that can be found. One ounce of it will dissolve half an ounce of the acid.—*South Western Med. Gazette*.

DR. L. D. SHEPARD, of Boston, is sadly afflicted in the death, by consumption, of a promising son of thirteen years. His many friends will sincerely condole with him.

AT THE LATE MEETING of the Mississippi Valley Dental Association, it was stated that Dr. J. Taft had not missed attendance since 1847, nor Dr. Geo. Watt since 1852.

DR. GEO. L. FIELD and wife, of Detroit, are spending some time in Florida and the south. Dr. and Mrs. A. P. Southwick, of Buffalo, are also in Florida.

THERE IS ALWAYS something pathetic in the calling of names by a weak writer. It gives him the kind of relief that women find in tears.

THE DENTAL COSMOS announces another enlargement. Henceforth each number will contain eighty pages.

THERE ARE one hundred and twenty medical colleges in full blast in the United States.

A DAUGHTER was born to Dr. B. L. Rhein, of Chicago, March 1, 1888.

THE Independent Practitioner.

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MAY, 1888.

NO. 3.

NOTE.—No paper published or to be published in another journal will be accepted for this department. All papers must be in the hands of the Editor before the first day of the month preceding that in which they are expected to appear. Extra copies will be furnished to each contributor of an accepted original article, and reprints, in pamphlet form, may be had at the cost of the paper, press-work and binding, if ordered when the manuscript is forwarded. The Editor and Publishers are not responsible for the opinions expressed by contributors. The journal is issued promptly, on the first day of each month.

Original Communications.

CONTRIBUTIONS TO THE HISTORY OF DEVELOPMENT OF THE TEETH.

BY CARL HEITZMANN, M. D., AND C. F. W. RÖDERKEE, D. D. S., M. D. S.

CONTINUED FROM PAGE 173.

J. B. Garot (Treatise on the Diseases of the Mouth. Am. Jour. Dent. Sc. Baltimore, 1843) described the follicles of the teeth as composed of a double fold which surrounds the *germ* of the tooth. The follicle resembles a serous membrane, and lines the interior of the socket to which it is attached. He further states that the follicle secretes an albuminous serum which lubricates the parts that it surrounds, and that the ossific matter is deposited upon the teeth by the vessels that penetrate the dental cavities.

M. Desirabode (Am. Jour. Dent. Sciences, 1847) concluded that the teeth are the products of a true secretory organ. They are developed in a fibrous sac which is derived from the fibrous tissue of the gums, and which is composed of a single and, not as others had stated, of a double membrane. This membrane (follicle) later becomes the alveolo-dental periosteum. Of the formation of the dentine Desirabode states that it is accomplished by accretion, and not

by a direct calcification of the elements of the pulp. In regard to the development of the enamel, this author is of the opinion that it is secreted by the follicular membrane, as he observed enamel upon the teeth of those animals only in which he noticed that tissue. In conclusion, on the formation of the enamel, he says, "We content ourselves with the following one (fact), extracted and translated from a German anatomist (Valcherus Coiten) who wrote two hundred and fifty years ago; a period when anatomy was first brought to light." The teeth are formed from a species of mucus enclosed in the cavity of a follicle; they are developed like a rudimentary body, around which an incrustation is formed, differing in that respect from the formation of bone, which is effected through the medium of a cartilage.

Edward Lent (From a translation of *The Am. Jour of Dent. Science*, 1857, p. 562) is of the opinion that the nuclei of the odontoblasts elongate, form the dentinal canals (the dentinal fibers), and around them the basis-substance of the dentine is deposited by secretion. He observed that the cylindrical ivory cells (odontoblasts) are not present upon the surface of the whole pulp, but only upon those parts which precede the formation of the dentine. Lent further states that one odontoblast may lengthen and form an entire dentinal tube (fiber), but that it is possible for two or more to unite. In regard to the development of the enamel, this author gives two illustrations, but says nothing more about them than that they are specimens of enamel.

J. Foster Flagg (*Dental Cosmos*, Vol. XIV, pp. 580 and 633) is of opinion that a space exists between the enamel membrane and the dental pulp into which there is poured out a plasma derived from the dental pulp, which afterward forms the enamel rods. This author further states: "Between the enamel rods from the commencement of their formation to the completion of their proper length, we have a network of organic structure, through the instrumentality of which the complete hardness of the enamel is effected, and its future nourishment from the enamel membrane maintained. This final hardening takes place from the exterior inwardly, and thus it is that we find finished enamel hardest externally."

Henry Sewill (*Dental Cosmos*, Vol. XVII, p. 658) gives a good account of dental development, principally taken from the views of Marcusen, Dursy, Kölliker, Waldeyer, Robin, Magitot and Tomes.

Charles S. Tomes (*A Manual of Dental Anatomy*, Philadelphia, 1882), after detailed description of the several steps of the formation of the primitive fold into the jar-like enamel organ, and the origin of the stellate reticulum from the epithelia of the enamel organ, states that as soon as the dentinal papilla begins to develop, the ameloblasts become elongated and enlarged. He further says that the whole enamel organ is derived from the oral epithelium, and that all must be regarded as "epithelial structures." This author then describes the formation of the dentinal papilla and the dental sac, and returns to a more detailed description of the enamel organ, where he states "that it may fairly be concluded that the enamel cells as they are used up in the formation of enamel, are recruited from the cells of the stratum intermedium. In regard to the stellate reticulum, Tomes says that its functions and destination are not very clear. With reference to the external epithelium he says that it is of little interest, save that it is a matter of controversy what becomes of it. He also observed the bead-shaped varicosities in the enamel cord.

The cement, this author states, is formed by the alveolar-dental periosteum in the same manner as bone tissue, when present in thin layers. Of calcification of the enamel Tomes says: "I am distinctly of the opinion that the enamel is formed by the actual conversion of the cells of the enamel organ into enamel." He also noticed that the stellate tissue of the enamel organ disappears before the completion of the enamel, but does not state in what manner the enamel attains its normal thickness.

In regard to the calcification of the dentine, this author is of opinion that the odontoblasts, when the formation of dentine is most active, have a broad base, which is directed toward the dentinal cap. They are in close contact with one another as long as the formation of the dentine is active, but when this is completed the odontoblasts become more elongated and rounded. Tomes further says: "The dentine is, I believe, formed by the direct conversion of the odontoblast cells, just as is the enamel * * * and is derived from them, and from them alone. The three structures (the dentinal fibers, the dentinal sheath, and the matrix between the latter) may be taken as being three stages in the maturation of one and the same substance. The most external portions of the odontoblasts undergo a metamorphosis into a gelatinous matrix,

which is the seat of calcification, while their most central portions remain soft and unaltered as the fibrils." In regard to the appearance of the globular territories, Tomes maintains the view that they are not formed by the odontoblasts, as he states "they are actually in the substance of the cap, their growth and coalescence obviously go on without any very immediate relation to the cells of the pulp. The occurrence of these globular forms, and consequent large interglobular spaces * * * is therefore an evidence of arrest of development rather than of any otherwise abnormal condition."

On the calcification of the cementum, Tomes says that the osteoblasts themselves become calcified, being derived from the inner wall of the dental follicle. He further endorses the statements made by his father, Sir John Tomes, and Mr. DeMorgan, which are given as follows: "Here (towards the bone) in the place of cells with elongated processes, or cells arranged in fiber-like lines, we find cells aggregated into a mass, and so closely packed as to leave little room for intermediate tissue. The cells appear to have increased in size at the cost of the processes which existed at an earlier stage, and formed a bond of union between them. Everywhere about growing bone a careful examination will reveal cells attached to its surface, while the surface of the bone itself will present a series of similar bodies ossified. To these we propose to give the name of osteal cells, as distinguished from lacunal and other cells." Tomes also describes the myxomatous reticulum of young pericementum, and then explains the development of cementum as follows: "The osteoblasts form both matrix and bone corpuscles; in Prof. Klein's words, 'each osteoblast by the peripheral portion of its cell substance gives origin to the osseous ground substance, while the central protoplasm around the nucleus persists with the latter as the nucleated bone cell. The bone cell and the space in which it lies become branched. For a row of osteoblasts we then find a row of oblong or round territories, each composed of matrix, and in it a nucleated branched cell. The outlines of individual territories are gradually lost, and we then have a continuous osseous lamina, with its bone cells. The ground substance is, from the outset, a network of fibrils; it is at first soft, but soon becomes impregnated with inorganic salts, the process commencing at the point of ossification.' The bone cells with their processes are situated in corresponding lacunæ and canaliculi, just as in the adult osseous substance."

R. Baume (*Odontologische Forschungen*, Leipzig, 1887) says that the dentine is formed by the *membrana præformativa dentis* (first described by Raschkow, 1835), which he suggests as existing between the newly formed dentine and the layer of odontoblasts, and which is composed of globules of different sizes. This author also states that this membrane cannot originate from ordinary connective tissue, but is specifically developed from the odontoblasts. He endorses the theory that both the dentine and enamel are formed by a secreting process. In regard to the external epithelium Baume says that it is lost long before the process of calcification of the enamel begins, but does not state what becomes of it.

With reference to the formation of the cementum, he believes that the tooth sac is the matrix for the cement. This author recognizes two distinct membranes as existing upon the outer surface of the enamel. One (the outer), a covering of cement substance (Nasmyth layer), the remains of the upper part of the tooth sac, and the other membrane which lies close upon the enamel prism, the remains of the *membrana præformativa (adamantina)*, a product of epithelial elements.

Concerning pigmentation of the enamel, this author explains that in such places there are inter-prismatic spaces present in the enamel that are filled *with air!*

R. R. Andrews (*The New England Journal of Dentistry*, Vol. II, p. 193, and *Transactions of the Ninth International Medical Congress*, 1887), speaking of the formation of the dentine, holds the opinion that the odontoblasts calcify and form the matrix (basal-substance) of the dentine, while the dentinal fibers are formed by separate pear-shaped cells situated between the odontoblasts. But the sheath of Neuman is formed by those parts of the odontoblasts which surround the dentinal fibers.

James E. Garretson (*The New England Journal of Dentistry*, 1883, Vol. II, p. 367), in an address before the New England Dental Society, said: "A mucous membrane does not dip down; it dips up. * * * Dentine, cementum and enamel are products of a common secretion, and this secretion lies with the dental pulp. There is no enamel pulp as propounded, and as is thought to be shown by the microscopists. * * * In the various days of fetal existence, the jaws are plates of cartilage. These plates are overlaid by mucous membrane. Between the cartilage and the mem-

brane the papillæ, known as dental germs, are first met with." *
 * * "A developing germ carries with it overlying mucous membrane, the membrane hugging it closely. This covering or envelope, constitutes a tunic;" * * * "A germ, originally microscopic, has enlarged until it stands in shape and size the representative of a tooth; this germ is enveloped in a double sac; it is overgrown on all its circumference by tissue which, later, is to express itself as alveolar process and gum." * * * "The formation of dentine completed, the covering of it with enamel begins; or rather this deposit is, to a degree, coincident with the dentinal formation. Secreted by the same pulp which forms the dentine, the same secretion, some portion finds its way into and through the primary sac. As it passes through this sac to be moulded against the second, it is modified by the epithelial surface which constitutes the outer face of the tunica propria." * * * "Between the enamel, thus formed, and the dentine, exists the primary sac; simply the modified mucous membrane, which we first saw overlying the papilla. The sac of mucous membrane continues to exist between these two hard bodies, and receives and modifies, for the support of the enamel, the liquor sanguinis found in the dentinal tubercles and intertubular substance. This tunica propria is the enamel membrane. It is from this that we receive impressions of pain when it becomes exposed by a break in the continuity of enamel." * * * "Enamel has no special pulp, as propounded by the histologists. It is also understood that it calcifies from the outside inward, and *not* from the inside outward."

(TO BE CONTINUED.)

DEAD AND DISEASED TEETH AND THEIR TREATMENT.

BY EDWARD S. NILES, D. M. D.

READ BEFORE THE CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY,
 OCTOBER 10TH, 1887.*

The subject upon which I have asked your attention this evening embraces one of the departments of our specialty which, during the past few years, has come from darkness into light, for, to the best of my knowledge, the treatment of teeth that had been de-

* Re-written and given in a lecture at the Maryland University Dental School.

prived of their central nerve and blood supply revealed little light or knowledge of the difficulty to be overcome. This was especially apparent in the prescribed treatment of abscessed teeth of long standing. Cold alveolar abscess, or "gum boils," as long as free from pain, have in the years past been considered by the dentist and patient of little importance. Two years ago, one of the most eminent of our profession in a dental meeting said, that "in his experience, he had found that it was better to let these teeth alone; if disturbed, inflammation and suppuration will follow."

Those who have attempted any course of treatment have been few, and the results must be suggested by the medicines and methods resorted to; the dressings advocated, for instance, are aromatic sulphuric acid, hydro-chloric acid, chloride of zinc, creosote, carbolic acid, salicylic acid and wine of opium. It will be seen that, with the exception of the last named, all these agents have a destructive power on soft, and some of them on hard tissues, and as from time to time they are applied, inflammation and breaking down of tissues, discharge of pus and serum follows. I once saw this state of things continue for weeks and months, while the good old practitioner informed me that when the canals of the teeth could be wiped dry it might be considered that the teeth were cured and could be filled; but that state of things did not arrive, and the young lady now wears four porcelain incisors attached to a orthodontic plate.

I am aware that it is claimed that dead and diseased bone tissues exist at the end of roots thus affected, and that these granules dissolve the bone and excite a healthy action in the surrounding parts. I am also aware that surgical treatment has been advocated and clinics given, showing how, by the use of the bar, or by incisions to the apex of the root, the "dental abscessing sac" may be destroyed and the dead tissue removed. I have followed the advice of men long in years and experience, and extracted teeth, cut off the end of the root, filled the canals and put them back, and thus the supposed evil existing at the end of the root has been eradicated and a healthy reaction set in. All these well-intended but misdirected efforts have failed, because of a misconception of the trouble. I draw these conclusions both from the results of the foregoing treatment and the fact that in ninety-nine cases out of a hundred the extraction of the teeth thus involved would cure the trouble in the

gums without treatment. This at once gives an idea as to the exciting cause of cold as well as acute alveolar abscess. Of the many improvements and advancements in various directions of which we can boast, the fact that though a tooth may lose its central vitality, become foul beyond olfactory endurance, and, as regards its cleanliness, only to be compared with dead men's bones, and yet be cleaned, disinfected, and set to work in one's mouth—this is not the least of that which has been accomplished.

To bring the subject clearly before our minds, let us for a few moments consider the tissues of a living tooth and their relations to each other and the surrounding alveolus, that we may more clearly understand what takes place when the central nerve-supply dies or is destroyed.

We will suppose that a vertical section has been made of a central or cuspid, a portion of which is represented in plates 1 and 2. From within outward, we have, first, the pulp and layer of odontoblasts, with filaments running from the odontoblasts into the tubuli which permeate to the inter-globular or granular spaces. These tubuli carry the nerve fibrils and what nourishing matter the dentine receives from within outward, at least as far as the inter-globular spaces; whether they continue further is not now clearly shown, but it is evident that these nerve fibrils anastomose with those from the cementum and peridental membrane freely at this space, though in all cases one would not be justified in saying that the nutriment supplied to this portion of the tooth comes from without, and not from the pulp.

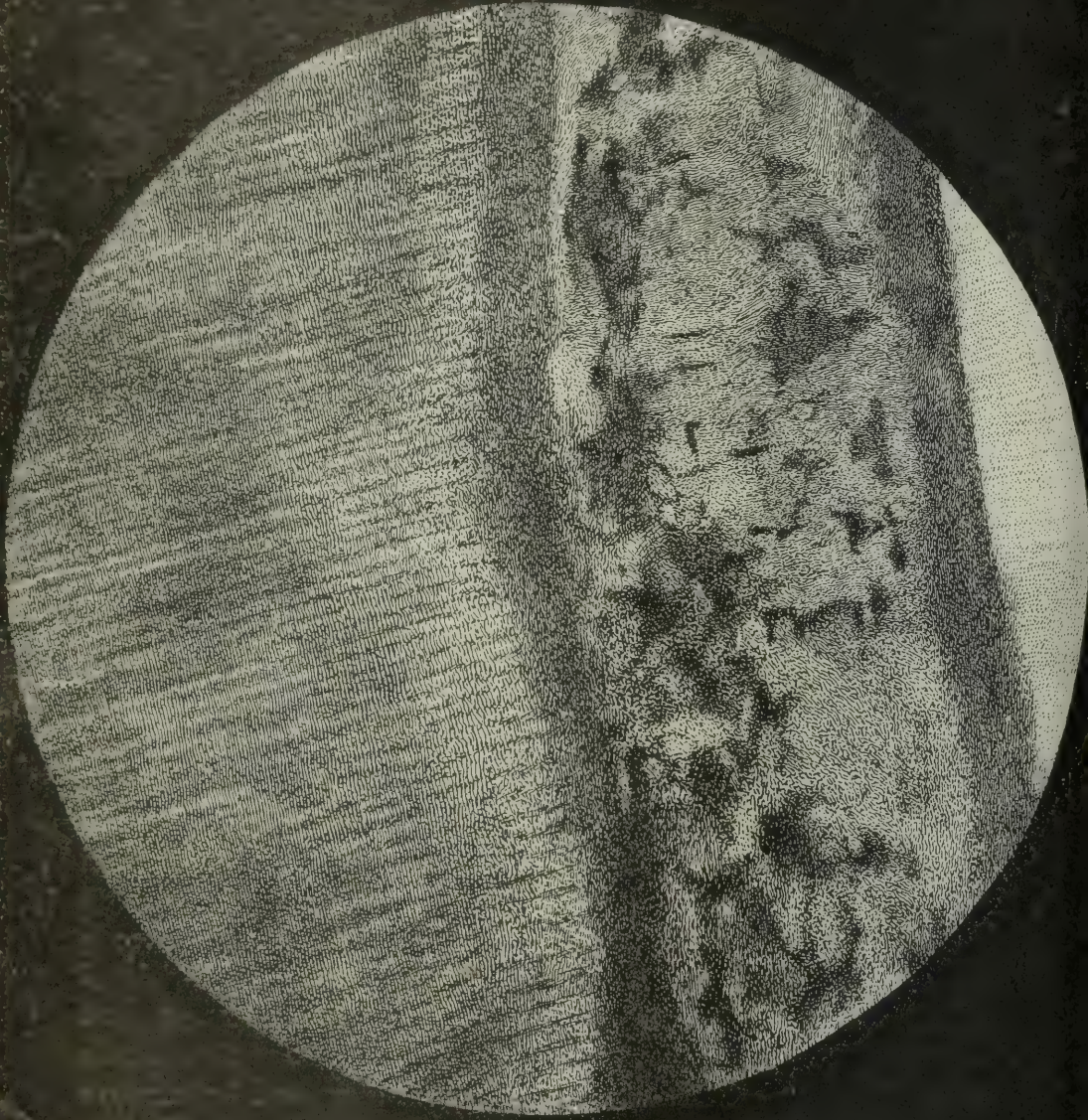
Inasmuch as the cemental structure is less dense and more abundantly supplied with living or soft tissues, we are justified in the conclusion that at least the inter-globular spaces receive the greater supply, if not the whole of their nourishment, from without.

Covering the cemental structure, the peridental membrane furnishes the connection between alveolus and cement, and a medium of connective tissue through which the efferent and afferent nerves and vessels pass. We have before us, then, the living dental matrix as at present commonly described in Dental Anatomy. As the lime-salts of a tooth do not die and enter into active decomposition with the soft tissues within any reasonable amount of time, their consideration is not necessary as a factor in diseased teeth. The mature, well-vitalized tooth-organ, is capable of repair when subject-

Fig. 1.



Fig. 2.



ed to injury, provided the cause of wasting tissue is mechanically or chemically removed; just the limit of this power cannot be determined in a given case, nor can we say just when this power may or may not be present. It is very evident that at times and in certain cases, a slight amount of mechanical or chemical interference with the pulp of a tooth will destroy its function, and render desired reparation impossible. There seem to be marked exceptions, however, where nature alone has not only overcome the destroying agent, but protected the exposed pulps with new formations of tissue.

Our success in assisting nature in these processes has thus far been questionable, as the many cases of diseased and septic teeth testify. It may be that exposed pulps at some future time will be capped to live, but with the present means at command they are, for the most part, capped to die, and with the increased possibility of retaining a higher state of vitality I believe it is better practice to destroy and remove a pulp than it is to cap, with the chances of death and disease which so frequently follow. The tooth organs that have lost their central nerve and vessels are called "dead teeth." Every one knows that if a thing is dead it has not life. A tooth that has lost its central nerves and vessels is still nourished throughout its periphery. It cannot then be called dead, and if such a tooth be treated in a way to retain the highest possible benefit from this source of support, it will be tolerated by the surrounding tissues, and prove serviceable for many years.

For convenience, I shall divide my subject into four classes:—

1. Teeth with central nerves and vessels extirpated, and free from internal and external septic infiltration, with the periodontal membrane performing its normal function.
2. Teeth with their central nerves and vessels destroyed, and their decomposed remains unremoved, and septic infiltrations extending to the periodontal membrane, which becomes inflamed at the slightest depressing influence on the general system.
3. The death of the central pulp, followed by putrefaction and infiltration of all the dentinal tissue, the cemental tissue infected, inflamed, thickened, and a connective tissue wall formed penetrating the deeper parts of the alveolus. This wall is usually located at the foramina at the apex of the root, and is generally known as the "secreting sac," leading from which is the fistulous passage open-

ing to the surface offering the least resistance of tissue. When this condition is allowed to continue for years, the root membrane is destroyed, and even the root itself is absorbed wholly or in part.

A tooth becomes dead when it loses its membrane as well as its central pulp. These teeth I have designated as the 4th class. Their destruction is rarely due to the death of the pulp by internal causes, but more especially from outward wasting of tissues, from calculus or diseased alveolar tissues, when without support such teeth may be called dead, irritating, foreign bodies.

In the four classes of diseased teeth mentioned we observe variable conditions, any one of which of the milder forms may be but the progressive stages of the same trouble, which if not arrested will lead to the loss of that tooth, if not to more grave results. A tooth if deprived of its central nerve and blood supply resists destructive agencies of decay by its chemical integrity, in so far as this integrity is not overcome by what may be called "greater chemical affinities." As it becomes septic, within the pulp-chamber, its destructive tendencies are two-fold; it is "a house divided against itself," and the only agents necessary to support and carry on the destruction of the tissues are water and air. The products of this change, as we find them, are derived primarily from the pulp matter, but later from the breaking down of the organic matter of the tubuli. The main portion of the pus, however, in the progressive stages, is derived from the diseased or infected tissues immediately at the apex of the root, the fistulous opening usually appearing on the surface of the gum, carrying or furnishing vent to the matter and gas to which it augments. The generation of gases accompanying the breaking down of the dental tissues is, for the most part, the same as those generated from decomposing organic bodies whose constituents are largely of phosphorus matter, as the brain, bone or fish. This gas I apprehend to be phosphoretted hydrogen. It is found also in closed cavities of decaying teeth, and is significant of decomposing organic and inorganic tooth structure into ultimate proximate principles, as lime, magnesium, phosphoric acid, or phosphorus, and probably the re-formation of other substances, as in the case of phosphoretted hydrogen. There are three known compounds of phosphorus and hydrogen—(PH^3) (PH^2) (P^2H). I cannot determine at present whether one or all are present, but am prepared to say the first named (PH^3) has been detected. And here I take the liberty

of calling attention to a paper previously published in the *INDEPENDENT PRACTITIONER* by me (see Vol. VII, p. 11), giving experiments to show the presence of free phosphoric acid in dental caries, derived from the decomposition of the proximate principles of teeth (phosphate of lime and magnesia), as it is seen that further proof of this decomposition appears in the presence of phosphor-
etted hydrogen in caries as well as in decomposing pulp matter.

If we are to weigh the questions of life or the death of an organ, our attention is first called to known arrangements of tissues, that involved in death and that living, and we draw our conclusions as to the vitality upon which rests our chief reliance for support; we look at the condition of a tooth without central blood-vessel or nerve supply, and we see at once that the only reliance for vital support is from the cemental tissues, and all treatment must be directed to preserve these tissues from the destructive processes progressing in the dentine. When once this infectious matter has invaded the pulp chamber and tubuli, the tooth becomes ever after an easy prey to these changes, and in no way can it be kept so free from septic influences as to prevent it from becoming septic.

I am strongly of the opinion, therefore, that great care should be exercised in the capping of exposed, or filling very near diseased, pulps. Barring inaccessible root-canals, which are very rare, the weight of evidence is in favor of destroying rather than capping a pulp. Good judgment, reinforced by the knowledge of a defective constitution and the general depleting effects of certain conditions and influences in life, will often decide what course it may be necessary to take in a given case.

But for various reasons teeth do die, and we find dead pulps resulting from numerous causes, and though not always septic, they are liable to become so if at all exposed. It is well known that a devitalized pulp may not cause any irritation, either during death or for years after, but this cannot be regarded as evidence that such teeth should not be disinfected, cleansed and sealed up, but should be regarded rather as an indication of the power of the general health to take up or absorb dead matter. Such power, however, may or may not be present at different periods of life. For instance, a tooth may remain quiet for years, and then suddenly enter upon acute inflammation and terminate in a chronic cold abscess. The poisonous matter generated from the dentine having infected at present

the soft tissues, the system no longer able to carry on the absorbing process, it expels the matter and provides for future accumulation by a fistulous opening and a connective tissue wall around the infected parts.

We have thus described the second class of teeth named, and indicated the progressive stages of septic influences which render the tooth more and more irritating to the surrounding parts. We often find that the fistula, if probed, leads to a large cavity immediately at the end of the root, and the root, denuded of its membrane, furnishes a portion of the wall to the cavity named. It has often been stated that in connection with the above described condition the primary exciting cause in many cases is superseded by a secondary cause. The alveolus is infected, dies or becomes diseased from the infectious matter from the tooth, a condition of necrosis existing which requires special attention and treatment independent of the tooth. During the time I have been in practice I have seen but one case of the kind mentioned, and, as has been said, I am of the opinion that the cases of diseased alveolar abscess referred to that cannot be cured by the extraction of the teeth involved are rare, showing that if the teeth can be rendered aseptic the alveolus and tissues about such would return to a condition of health and usefulness.

I think I have made it clear that I am in favor of securing the best possible condition of dentinal tissue where there is the least possibility of their becoming pulpless, either by accidental, chemical, or by any other means. By observing the cuts, we see a somewhat enlarged or thickened cemental covering, in which case the possibilities of life after the death of the pulp are quite considerable. I am aware that similar thickenings of the cemental structure are classed as abnormal growths, but if observation be made it will be found that the thickness of the cementum differs largely in proportion to the dentine in different teeth, giving to some pulpless teeth a great degree of vitality.

TREATMENT.—When the cause of the trouble and the conditions of tissue are well understood, the question of treatment is often very simple. With the present difficulty and the means at hand, barring mal-formation of the roots, the chances of success are more than equal to any operation we are called upon to perform. As in all diseases of the system, if our patient is strong and vigorous, no

matter how long the abscess has existed, fifty per cent. of success is assured. On the other hand, desired results are not so speedily obtained in more delicate or enfeebled health. In all cases, relief from pain is the first step in treatment; often an aching, exposed pulp may, by the use of narcotics, be treated into a state of rest, and the pulp destroyed.

For the destruction of pulps, I have found for the present, nothing that meets the wants of the case so well as arsenious acid, though I am of the opinion that a better preparation can be prepared. That used by me is composed of equal parts of arsenious acid and the acetate or sulphate of morphia, made into a paste with carbolic acid or creosote. Right here is danger. Many inflamed peridental membranes are caused primarily by arsenic preparations getting through the apex of the root and creating dead tissue and aseptic influences. It is better to cause the patient a little pain than to run the risk of a diseased membrane. I have used nitrate of silver with very favorable results. It does not cause pain, and its destruction of tissue is immediate.

With the usual means, the roots are cleared of all the pulp matter possible, dried with hot air until there is no moisture; not only the pulp canals, but the dentinal tubes should be dried as far in as possible, after which the alcohol may enter even in the inter-globular spaces. In filling, I make use of the well-known preparation of gutta-percha and chloroform. In the treatment of abscessed and septic teeth, of course a long cleansing process is necessary. I strongly oppose the method of opening through the apex of the root, as by so doing there is great liability of further infecting the tissues by means of the infected drill, though I use the drill to get a free opening as near the apex as possible. This done, the canals are washed out thoroughly with warm water and dried with hot air, after which it is saturated with a solution of strong bichloride of mercury (five per cent.),* the opening in the crown being stopped

* At the meeting at Newark, N. J., before which this paper was read, my attention was called to the solubility of bichloride of mercury in water. Three years previous, I had prepared for me a bottle containing a strong solution of the bichloride, with directions on the label to prepare any strength down to one part in three thousand. I find the label reads one in twenty, not twenty per cent.

The strongest solution used by me is, therefore, five per cent., and this for

with gutta-percha. This is repeated once in three or four days until there is no smell of phosphoretted hydrogen, and I am satisfied that the tooth is thoroughly aseptic, when it is sealed up and filled as in the previous case.

After a portion of the peridental membrane has been destroyed, is it possible to render the cemental structure so aseptic that the alveolar tissues will harden about the exposed surface without irritation? Of course there is not that assurance of success as in the previous cases, but in the mouth of the average person of health, the bichloride treatment should be tried both outside and in. I have been surprised at the results of the cases treated; out of three, two have been successful; the other was a case where I could hardly expect success; so extensive was the trouble that three of the superior centrals had their roots partially absorbed, and the only course seemed to be extraction, which, after the operation, I did not regret at all. Although badly diseased and absorbed, the alveolus healed very quickly without treatment.

It is hardly necessary for me to say that my treatment for the fourth class of teeth named is extraction, as they are indeed "dead teeth" and "foreign irritating bodies."

treating dentinal tissues, not soft tissues, or hard tissues where it would be liable to reach the soft tissues. For the latter use, the strongest used would be one part in two hundred.

There are two chlorides of mercury; First, calomel, sub-chloride, or protochloride of mercury, or mercurous chloride. (HgCl .) This differs from bichloride in not being soluble in water.

Second, Corrosive sublimate. Chloride of mercury. Bichloride or perchloride, or mercuric chloride. (HgCl^2 .)

This dissolves in three times its weight of boiling water, but requires sixteen parts of cold water to one of bichloride.

Muriate, or chloride of ammonia, is used to render bichloride of mercury more soluble in water. It does not change the chemical composition of the bichloride, and no new compound is formed, but acts simply by its presence. The bichloride may then be secured in any strength desired.

I cannot see that the ammonia chloride thus used has any injurious effects on the tooth-structure, or at all hinders the antiseptic action of the bichloride.

DENTAL RESOURCES.

BY S. B. PALMER, M. D., &c.

READ BEFORE A UNION MEETING OF THE SIXTH, SEVENTH AND EIGHTH DISTRICT
DENTAL SOCIETIES, AT BUFFALO, N. Y.

When a young man decides to enter the dental profession, the usual method is to spend some time in a dental office and conclude his studies at a dental college. A glance at the college notices in dental journals will show that there is no lack in numbers or grades of such institutions, with locations convenient for students in almost every section of the country.

Again, as you turn the pages of the voluminous catalogues furnished by dealers in dental supplies, it would seem that every article or appliance needed was therein described or illustrated. Enter the dental depots and there may be found a complete outfit for all that is usually required in the office. Leaving college the student enters the higher school of practice, with possibilities as much above college training as the latter is above an office term. Up to this time, the way has been mapped out, and little more than attention to study is required to pass a creditable examination. The school of practice develops the capabilities of the student for his life work. It announces no special course of study, fixes no time for graduation. The studies are progressive, and all previous instructions are looked upon as merely preparatory, and things of the past. Dental periodicals take the place of text books, clinical instructions are received from practice, and society meetings more than fill the professors' chairs with practical and scientific lectures. The rapid growth of dentistry is the outcome of its many resources. When it was known that the new art was more lucrative than ordinary occupations, there was no lack of willing hands to engage in this new industry. From the barber to the surgeon, the jeweler to the sculptor, there came more or less skilled laborers, bringing with them the tools, appliances and materials used in their respective occupations. Wise legislation has restricted this influx of labor, but the contribution of materials remains and is a great help in the laboratory and operating room to-day. No one who is legally qualified to open an office in this State need feel discouraged, however limited in means or inexperienced in practice. If fortunate enough,

to possess a degree, the public will receive it for all it is worth, and to the holder it is worth more than it cost.

Without this valuable recommendation, the way to public confidence is harder, and more private study will be required to make up the deficiency. Success, however, will depend upon merit, which, like blood, will tell. Education and opportunities may do much in establishing and maintaining a practice, yet a born dentist will grow to the full stature of a man. Retarding circumstances may hinder in early life, but once established the school is open alike to all, and by extra exertion one may make up time and come to the front. While the candidate for political office must answer for the sins of his parents as well as his own, the public generally judges of a dentist by what he appears to be, what he does, and by his standing with his professional brethren. Although modern practice requires a much higher grade of operations than in former years, the facilities for obtaining education, as well as convenient appliances, render the study of dentistry easy compared with the writer's early experience.

Many years since, a farmer boy living three miles from the nearest village and sixteen miles from the then village of Syracuse, was in need of a superior denture of nine teeth. Without ever having seen a dental plate or the inside of a dental office, without personally knowing any dentist except the one who, in modern language, was "on the road," and who did the extracting, this boy conceived the idea of doing the work for himself, or taking up dentistry without a master. Here commenced the study of resources. The first step was to see a plate. Through the kindness of a lady the article was examined, and a resolution formed to make the trial. It is needless to say that lack of funds stimulated action, and verified the adage that "necessity is the mother of invention." Upon inquiry, dental supplies were found at a drug store in Syracuse; also a book, "The Human Teeth, by Paul B. Goddard," published in 1884; price \$5. The book was purchased. The investment seemed large, but tolerably safe. That old book is number one of, and a treasure in a professional library to-day. Though by no means the best work of the time, it was the only available one, and it served its purpose nobly. The cuts were excellent and the illustrations well defined. Study was limited to the one object in view, without the remotest idea of any practice of dentistry beyond that.

As the mind developed, machinery and appliances were improvised and held ready for use. An alcohol blowpipe was made, and experiments tried in hard soldering. A spinning wheel was converted into a grinding lathe, impressions, casts and dies were produced as directed in the book, and a silver coin reduced to a plate upon the anvil and by grinding. The plate was struck up, clasps soldered, tried in the mouth and pronounced a good fit. By the aid of the druggist's clerk and the articulating models the teeth were selected, and in time the case was finished at two o'clock in the morning, some six or seven months from the commencement. The size and style of the plate was exactly on a line with the engraving in the instructions, the fit and finish was as good as would be produced to-day. The work was mostly done at odd hours, and as fast as the mind could be educated to do it properly.

Following this first operation a few plates were made for friends. Excavators and pluggers were fashioned and teeth filled for members of the family, till the study of dentistry was finally decided upon. A course of office instruction followed, and in time practice was commenced, all of which was comparatively easy after the study mentioned above, and thus I became a dental practitioner.

With a will the way is now open to almost every undertaking. In dentistry, societies and dental journals are constant helps. No one need be behind the times in practice; none can be up in practice without such helps. There are too many dental hermits, men who confine themselves to their office demands and have little association with others outside. This habit has a tendency to narrow one's usefulness and circumscribe his practice. A few years devoted to extracting teeth and making plates would disqualify an operator for successfully treating roots and inserting crowns.

In early times, the northern portion of Onondaga County grew timber suited to the manufacturing of salt barrels, for which there was great demand. Almost every farm had its cooper shop. Competition was sharp and prices low. The quality of work turned out was as near the inspector's cull line as possible. This kind of cooperage was soon learned and made profitable, but when a regular mechanical workman went into this new specialty his competition for good work was against him. He had not the slightest of hand to make the number necessary for competition. On the other extreme, when the timber was used up and the rapid workman undertook tight work, his failure was in quality instead of quantity.

To elevate dentistry, one must understand the ways and means to do it. It is very important to understand how little we know. This can be done by comparison, and gatherings like this afford the best opportunity for such knowledge. It may be regarded as a fact that no dentist can be in the front ranks who neglects to attend societies or to take the journals.

Perhaps the next most important help to dentistry is the outcome of dental appliances, in connection with dental depots. Dentistry made the demand, moneyed manufacturers experimented and furnished the supply. Notwithstanding centralization and combinations are detrimental to the consumer, this does not alter the fact above stated. There are two sides to this question of combination. Every trade strives to protect its own interest. When dentistry looks through its spy-glass, it sees a large monopoly constantly collecting tribute from the profession. When patients turn their glass upon dentistry, they see a combined sentiment that operations are worth all that can be obtained for them, and bills rendered for all they are worth. If dentistry will turn the glass and look in the other end, it will see that another man's bull has been gored.

Calling upon dentists of known ability is another means of information. Some good points are sure to be gained. Don't form hasty opinions of new methods of operations because of criticisms. Nearly every advance of any value had to undergo this ordeal. "Survival of the Fittest" is the foundation of practice. No one method or material is best for all, as may be seen in the manipulation of gold. In proper hands good work is done with each variety. The requirements are, that the gold must be held in absolute contact with the walls of the cavity; a thorough knowledge of the working of various preparations gives an operator the advantage of adaptation to circumstances. Again, there are extremists, or specialists, in operative dentistry, both working for the same end—tooth preservation. It delighted the late Dr. Webb to give the profession the highest type of instructions in contouring and finishing fillings of cohesive gold. His work upon this subject must stimulate every operator to do better and aim higher in this direction. At the other extreme, Dr. Flagg's work on "Plastics and Plastic Fillings" will be found equally important, as it teaches the special conditions of teeth and their relations to other filling materials for preservation far beyond the possibilities of gold to

accomplish. The prudent operator informs himself of both methods, and thereby is able to adapt materials to circumstances.

It is a privilege, and often a convenience, to obtain articles outside of the trade. This can be done by means of circulars and catalogues. Every trade or industry has its price list, and generally an illustrated catalogue. It has been my pleasure to read the "*Scientific American*" for thirty years. When the address of any firm or trade is wanted, a letter addressed to that paper has given the information, and thus the way is open for correspondence. As opportunity occurs, it is well to obtain catalogues of various trades. None are more beneficial to a dentist than the jeweler's. In some respects it is better for many articles used in the laboratory than a dental catalogue.

A perusal of the illustrated catalogue published by F. W. Gesswein, No. 39 John Street, New York, will show polishing wheels, brushes and polishing powders in great variety at figures as low as the trade will warrant, and with no combination to secure exorbitant rates.

A large druggist's catalogue, published by Whittall, Tatum & Co., 410 Race Street, Philadelphia, Pa., will give cuts of syringes, brushes, glass bottles, boxes, labels and every article in that line.

James W. Queen & Co., 224 Chestnut Street, Philadelphia, publish sixteen catalogues, some of which contain important information for a dentist. Send for a condensed catalogue, which describes the contents of the others.

I wish to give Dr. H. C. Merriam, of Salem, Mass., credit for many valuable suggestions given in a clinic at the Congress.

For dry grinding of almost any material in the laboratory, use wheels of emery and corundum. Send for circular to Vitrified Wheel Co., Westfield, Mass., or to the Waltham Emery Wheel Co., as advertised in the *INDEPENDENT PRACTITIONER*. Soldering blocks made of boiler covering, asbestos and magnesia, light, clean, non-conducting and very cheap, can be obtained at boiler shops.

Small polishing wheels and points for cleansing teeth may be made from Faber's ink erasers. Twist drills may be made from piano wire without drawing the temper. They cut rapidly, and will drill on a curve without breaking. The manufacture of them has been placed with Philip Schmidt, 218 West Twentieth Street, New York, who is well known as a first-class repairer of dental in-

struments. In polishing with felt, use two wheels upon the mandrel. The space between retains the powder, and the piece, if thin, may be polished on the edge and sides at the same time.

Leaving this clinic I will add that waste amalgam may be converted into a new article, even better than the average of the original, with very little trouble or expense. Place the waste in a crucible without flux, heat to redness for ten minutes, weigh the ingot thus obtained, and to each ounce add five pennyweights of pure silver, two pennyweights of tin, and eight grains of gold. Melt under borax. No more heat is required than to make the mass fluid. Stir with an iron wire, and cast the ingot in convenient shape for filling. A good alloy will be the result.

Very few seem to appreciate the advantage of stoning such burs as are often needed for special use. Procure the knife edged Arkansas stone slips, place the bur in the mandrel of an old hand piece, or a socket made for holding burs, wet the stone with glycerine and water, or with light oil, and use the stone as you would a file till the edges are sharp. It is well to work with a glass. Care is necessary or the stone will become nicked. Keeping the stone in order is the most particular part of the operation. This is done with fine emery paper. Cut a sheet of paper into strips about two inches wide, the shortest way of the sheet. Make the strips into a pad upon a piece of wood the same width and about two inches longer. Secure the first paper to the wood and the ends of the pad with glue or mucilage. In using, the upper leaf may be torn off when the grit has been used up. To prevent nicking, the stone should be drawn parallel with the pad. The emery cuts rapidly, and a sharp, thin edge can be produced in a very short time.

MY WAY OF TREATING NERVE CASES.

PAPER READ BEFORE THE PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

BY THEODORE F. CHUPEIN, D. D. S., PHILADELPHIA, PA.

When I speak of "Nerve cases" I include all those cases wherein the nerve or pulp is involved. I do not know, in what I have to say on this subject, whether I have anything new to advance, or that my way of operating has any features of originality, so that

those who may be disposed to read this may only be going over the beaten track, yet the learning of some little point of difference in the manner of doing the same thing is a sufficient excuse or incentive for offering an article on a hackneyed subject.

As to the capping of exposed pulps, or pulps nearly exposed, I may say that persistent efforts at this operation for many years past has rather tended to take the starch out of my creed in it. I believe that many cases of what have been regarded as successful operations in this line are successes founded in the imagination or belief of the operator, and not on good grounds; or that they exist in those cases of remarkable constitutions, with a cat-like tenacity to life in the pulp, which we seldom see or have to work for in these days of degenerate health. We have all experienced isolated cases of pulp exposure, when the persistent application of arsenic to the bare tissue has failed to devitalize, and cases are on record in which arsenic has been picked into the pulp, and even this has failed to devitalize. Cases like these might be capped successfully, and life insurance companies could take extraordinary risks, and still make money, on pulps of this kind; but in the very large majority of cases of pulp exposure, pulp capping may be regarded in the same light in which Dr. Hodgkins regards colicute foil—"a delusion and a snare." I have come to the belief that when a tooth has ached for an hour or more, and that this aching has occurred on two, three or four occasions, that the shortest road to the end is to devitalize and make no attempt to cap, unless, as I said, the patient is one of a robust, vigorous, strong, healthy constitution, which promises the best chances for the success of the operation of pulp capping. If attempted otherwise the operation will surely reap failure, or if successful the success will be short-lived, and he will in all probability have to remove the capping, devitalize and fill roots and crown. I am, therefore, not enthusiastic about capping pulps, and believe that my patients' interest as well as their comfort is better served by root and crown filling.

When the pulp is to be destroyed, if the tooth is giving pain I cleanse out the cavity carefully and apply as much acetate of morphia as will lie on the end of the small blade of a pocket knife, mixed into a paste with oil of cloves, eugenol, carbolic acid or creosote. I apply this in the cavity and seal it with a pellet of cotton. This will ordinarily soothe the pain and keep the tooth

comfortable for twenty-four hours or more, and bring it into a better condition for the application of the arsenic. At the next appointment I apply the arsenic. Whenever I can possibly do it, I apply the rubber-dam before applying the arsenic, unless the cavity is easily accessible, or is in the crown surface of a molar or bicuspid, or is in such a position that the sealing plug will not cause the arsenic to ooze out. I always aim at making the application to the actually exposed pulp. In doing this I do not merely apply it to the point that I see is actually exposed, but I probe it in until I see the patient wince or flinch. I feel then that the arsenic will do its work effectually. Sometimes the pain is so severe that I cannot, with the first application, apply the arsenic to the actually exposed pulp. In such cases I rely on the first application for the obtunding effect of the drug. The next application may be made directly to the exposure, as the septum of decayed dentine may be almost painlessly removed to enable me to do this. I leave the arsenic in the tooth from one week to ten days—the text books to the contrary notwithstanding.

The application of arsenic has given me so much trouble from the intolerable pain which it gave my patients, that I have as often shrunk from applying it as they have to have it applied. I have spoken on this subject at different dental societies, only to hear men say “they never have experiences of that kind,” but I regard such language in the same light as we regard those operators who never have failures.

Before Dr. Jas. Truman and Dr. E. C. Kirk made their experiments with arsenic, combining it with other drugs for the purpose of making it a painless devitalizing agent, I had sent out to England and procured through Messrs. Ash & Sons, of London, some of “Baldock’s improved nerve destroying paste.” This preparation guaranteed the painless destruction of the pulp, and I must say that in my hands it has met all requirements, and has been used by me with the most gratifying results. Nearly all the patients for whom I have used it testify in its favor; some to no pain, others to but slight pain, and very few to a pain, or uneasiness extending to more than four hours; in no case was the pain violent. On account of the success I have had with this preparation, I have not tested either Dr. Truman’s or Dr. Kirk’s formulas.

The pulp being destroyed, my next procedure is to open freely,

fairly and directly into the pulp chambers and roots. I do this generally with corundum points on a mandrel secured in the hand-piece of the dental engine. I do not make use of the corundum points which are sold for this and other uses, but make what I want for the case in hand, from small pieces of old broken corundum disks, by heating the mandrel in the blaze of the spirit lamp, coating it slightly, while hot, with gum shellac, and attaching to this small pieces of broken disks. These are in turn kept hot by passing through the blaze, and then rendered cylindrical by manipulating with the fingers, or rolling on the bracket table until they take the form of a fissure bur, or an inverted cone bur. With this, kept well moistened with the drop tube, I cut away all weak points of the crown to secure me a free entrance into the pulp chamber and roots. The borders of the cavity being thus prepared, my next procedure is to apply the rubber-dam. I secure this, not only over the tooth I am to work on, but over two or three others, so that my sight and manipulation may be untrammelled. In the use of the rubber-dam I avoid the help of clamps as much as possible. I may use clamps to aid me in applying the dam, but I generally remove the clamps after I have secured the dam with ligatures. Where there is a strain on the dam which might cause it to slip off the tooth, I make a very large knot in the ligature so as to act as a shoulder or stay to prevent the dam from being pulled away from the tooth, and I put smaller knots in such ligature that passes around the teeth. These knots permit the dam to be pressed well up on the necks of the teeth. I place these knots on the lingual or palatal surfaces of the teeth, and tie the ligatures on the labial surfaces. The dam being secured, I first make my entrance into the nerve-chamber with excavators, removing all loosened decayed dentine overlying it. I next clear my way further with a large oval bur in the dental engine, should the case be an upper molar, stopping from time to time to blow out the debris made by the bur with the chip blower, or cleaning out what cannot be blown out with instruments suitable for the purpose. The pulp-chamber being freely entered, I direct my attention next to the roots.

It will often be found that although the pulp may be destroyed there is considerable pain experienced if the effort be made to remove it from the roots. We can account for this in no other way

than that the arsenic may have devitalized to a certain point, but beyond this point the pulp is alive, and it is the forcing of the dead part of the organ on to the living, in the effort of removal, or the severing of the living from the dead portion, which causes pain. To keep up this infliction for an indefinite period, giving considerable pain at each thrust of the barbed broach for the removal of the devitalized part, is a procedure that few are disposed to put up with, and I have found that the quickest way for the operator and the most satisfactory one for the patient is the operation known as "knocking out the pulp." This operation consists in sharpening a piece of orange-wood, by whittling it and filing it down to a very fine attenuated point, approximating in length and size to the size of the pulp to be removed. The approach having been made accessible, the point is dipped in carbolic acid. It is then introduced into the root where the pulp is to be removed, and gently insinuated therein until it holds its position. Sometimes it has to be held with the left hand in position, but it is better when it can be introduced sufficiently far to keep its position itself without being held, than to hold it with the left hand. A quick, sharp, decided blow is given to the protruding end of the stick with a small mallet in the right hand, and the operation is completed. Patients report ordinarily little or no pain, others severe, but over so quick that it is done before they have time to complain, and the large majority who admit severe pain prefer this short operation to the tantalizing one of fishing out the pulp with the barbed broach. Generally the pulp, which is completely crushed or mashed by the stick, comes away when the stick is withdrawn, but when it does not, it can be painlessly removed with the pulp canal cleansers used for the purpose. Should the stick break off in the root, it may be easily drilled out, or it may be left in as a root filling, there being sufficient carbolic acid absorbed by the stick to render antiseptic so much of the pulp as may have been pressed between it and the walls of the root canal.

There are many operators who contend that the roots should never be reamed out with pulp canal reamers, and say they should be left as they are made by nature, only cleansing them thoroughly. I cannot, however, conceive how this thorough cleansing can be accomplished unless room is made to do the cleansing, and for this reason I use pulp canal reamers to assist in this part of the work.

If medicines are used for the cure of disease in the roots of teeth, there must be space to make the application of these medicines, and hence the reaming out of the roots is admissible and proper. Of the many instruments put on the market by dental instrument manufacturers, I regard none so highly as the Murey nerve canal reamers. These were once manufactured by the S. S. White Dental Manufacturing Co., and the instruments made by them were a pleasure to work with. They were keen, well tempered, each leaf of the cutting head the same size and on a level with its fellow, and the shaft just flexible enough in proportion to the size of the working points. But since they have discontinued making them, I have never been able to procure from any instrument maker any of these reamers so admirably adapted for the work as those I first obtained from the White Company. Some operators have told me that they break many of these drills in the roots, but I can assure my listeners that I have only had one accident of this kind happen to me after perhaps two or three years' use of these instruments. The accident, I think, is likely to occur from the directions that are given for their use. We are told that the smallest size should be used first, gradually increasing as progress is made. Now my way of procedure is just the reverse. I use the largest size as I enter the root, and ream out with this to a certain depth, cleansing the debris constantly as I proceed; then I use a size smaller and proceed in the same way with this, and finally with the smallest size. I use only three sizes. If there is any choking of the canal it is needless to expect these instruments to make way through the obstruction; they will not do it, for they are reamers, not drills. I free the obstruction with the smallest probes, and when the probe enters the canal the reamers will follow and make clean work. The probes I make myself, out of piano wire, by securing a piece in a suitable handle and cutting it down gradually on a coronium stone in the polishing lathe, and afterwards bringing it down to the finest point with emery paper. A probe of this kind possesses all the flexibility necessary for the work expected of it, and is sufficiently tough never to break off in the canal, except by very rough or careless usage.

It will be found that in many roots the entrance or opening is not sufficiently cylindrical to permit the use of the reamers at the offset. They are uneven and ragged, and if force is used to make the reamers cut the chances are that they may be broken by the force

used. I overcome this difficulty by first preparing the way by the use of a flexible bur, such as is known as 160 of the S. S. White Dental Catalogue for 1876, in the list of instruments for the dental engine. This instrument smoothes down the angles at the opening and prepares the way for the reamers to follow without liability of breaking. The roots being all cleaned out by the use of the reamers and other instruments used for the purpose, are then filled. If the case is one of pulp devitalization, the roots and crown may be filled at once, but if it be one of putrescent pulp or alveolar abscess, I treat the roots by medication and disinfection before final filling. I fill the roots with cotton. I have been using cotton as a root-filling for twenty-five years, and though I have tried the other materials suggested, I have not been able to see that any of them possess advantages over a root-filling of cotton. With the roots prepared for filling as I have described, it is quite as easy to fill them with wood, chloride or phosphate of zinc, gold, tin, lead or gutta-percha, yet, as I have said, I cannot see, nor has experience taught me, that any of these materials are any better than cotton. I introduce the cotton in very small pieces, about the size of a mustard seed bird-shot, saturated with creosote or carbolic acid, or with an ethereal solution of iodol, and not in a long string, as is generally done. Introduced in this way the cotton can be carried up as far as the reamers have prepared the root, without choking, which is not always possible with cotton made into a long thread or string. The roots filled, I fill the crown with gold or amalgam, as seems best for the case.

If I have a pulp case with an external fistula to deal with, I do not put on the rubber dam until a cure is effected. I pursue the same treatment in these cases, in the matter of reaming out the roots, removing all debris as I proceed. Before medicating the roots I make sure that the canal is open at the apex, by using the probe freely and judging the length of the root by the depth that the probe passes into the root, as also by the flinching of the patient when the probe passes through the foramen. I use as medicines, 1st, the bichloride mercury (1 to 1000) freely on a probe to which a few shreds of cotton are attached, pumping this in. If there is much pus I use after this the peroxide of hydrogen in the same way. After this I pump creosote or carbolic acid through the root along the track of the abscess, until it bubbles or froths at

the fistulous opening*. I have had such good success with either of these two old remedies for the treatment of abscess, that I have great reliance on them. If these medicines refuse to pass through the root and appear at the fistulous opening, it is a sign that the apex of the root is not freely opened, or it may be that the end of the root is crooked, as is frequently the case with the ends of the roots of the lateral incisors and the roots of the first bicuspid. If the root is crooked nothing can be done to free it, and all that may be done is to treat the abscess from the outside. I never feel as confident of a cure when the abscess is treated through the external fistula as when medicines are carried through the root and along the track of the abscess. If the tooth be a central incisor, a cuspid, a second bicuspid or the palatine root of an upper molar, the failure of medicines to pass through will doubtless be due to debris choking the foramina of these roots. This must be cleared away with probes or broaches, otherwise a cure cannot be looked for. It is the action of these medicines on these diseased surfaces which effect the cure, and if the medicines do not come in contact with them a cure cannot be expected.

It is well to examine your probes and broaches from time to time with a strong magnifying glass, as there may be flaws in them which may not affect them at first, but which may cause them to break after constant use, and as will be most likely, to break in the root, causing the operator a world of trouble to remove. When such flaws are discovered it is best to discard the instrument rather than run the risk of a fracture in the root.

The abscess being treated as described, the root is filled lightly with cotton; the orifice of the cavity is also lightly sealed against the ingress of small particles of food. If on the return of the patient things look favorable, the root may be filled tightly with cotton and the orifice also closely sealed. If unfavorable a removal of the medication is indicated. On the third presentation, if on the removal of the cotton it is found clean, free from stain or odor, the rubber dam may be applied and the tooth filled. The roots

* Would it not be better to use the detergent (peroxide of hydrogen) first, and follow this with the germicide or antiseptic? We cannot comprehend the reason for the employment of the mercuric chloride and carbolic acid both. Creosote, not being of the same nature, is never indicated where carbolic acid is.—*Editor.*

should be made quite dry before filling. If the case is one of a central or lateral incisor or a cuspid, where the entrance to the root is made through the palatal aspect of the teeth, I prefer to fill the cavity (after filling the root) with gutta-percha, and let the case go thus for a year or more. There is little or no wear on the gutta-percha on these surfaces, and should there be any after trouble (which might occur when all things looked favorable), it is easy to remove the gutta-percha and renew the treatment. All good soldiers look to an easy retreat. In bicuspid and molars, where the approach is made from their disto-masticating or mesio-masticating aspects, I fill the roots and cover the floor of the cavity with gutta-percha, letting this extend by gradual manipulation to a feather edge at the cervical margin of the cavity, and over this I fill with phosphate cement. Should the case give trouble after a year's probation, it is easy to remove the filling and renew the treatment to give relief.

In cases of putrescent pulp, I get rid of the odor by first washing out with Eau de Cologne.* I then apply the dam and use bichloride freely, and next the peroxide of hydrogen. I disinfect with a saturated solution of iodol in ether. I have been using this in preference to iodoform because of the disgusting and persistent odor of the latter. In conversation with a physician who has quite a large practice, for whom I was treating a tooth, he informed me that iodol was much more extensively used as a disinfectant among physicians than iodoform. My success with it, as far as I have been able to observe, has been very marked. If there be any truth in the quotation "*Similia similibus curantur*," then iodol ought to cure putrescent pulp, for if a probe be dipped in the solution and then put into the blaze of a spirit lamp it will give off an odor almost identical with the odor we are all familiar with as coming from putrescent pulps. Try it.

In immediate root-filling I have not taken much stock, yet I think when a dry, powdery condition of the pulp is observed, or where the pulp has been devitalized and the pulp all removed and the roots properly treated and disinfected, the case may be permanently filled, but I do not think this should ever be done in cases of alveolar abscess or putrescent pulps.

* Not a disinfectant.

Reports of Society Meetings.

NINTH INTERNATIONAL MEDICAL CONGRESS, WASHINGTON, D. C.
SEPTEMBER 1887.

SECTION XVIII. DENTAL AND ORAL SURGERY.

REPORTED FOR THE INDEPENDENT PRACTITIONER, BY "MR. M. W. J."

CONCLUDED FROM PAGE 108.

CLINICS.

The Franklin School Building, corner of 13th and K Sts., was devoted to clinics, the exhibition of appliances, and the exhibits of the several dental manufacturing companies.

The basement was fitted up with everything necessary for clinics in prosthetic dentistry. Here Dr. L. P. Haskell, of Chicago, and Dr. John Allen, of New York, gave clinics in continuous gum work; Dr. J. Hall Lewis, of Washington, D. C., in gold plate work; Dr. W. W. Evans, of Washington, D. C., in zylonite and eolloboid; Dr. C. C. Carroll, of Meadville, Pa., in cast aluminum plate and bridge work; and Dr. J. J. R. Patrick, of Belleville, Ill., his method of making gold crowns.

On the first floor all the desks and benches had been removed from the different school rooms, and twenty-four operating chairs, each one placed inside of a low railing protecting operator and patient from the crowd, amphitheatre platforms having been erected for the convenience of spectators.

On the floor below were found the displays of the S. S. White Co., the Welch Dental Co., R. S. Williams, The American Dental Mfg. Co., The Wilmington Co., and the dental specialties of Seymour & Johnson. The water power in the building was not sufficient to run the water motor of Dr. Campbell, of Edinburg, Scotland, which was exhibited in the court of the Arlington Hotel.

Among the appliances exhibited were the Interdental Splints of Dr. Wm. Carr, of New York; a Bandage for the Correction of Irregularities, by Dr. V. E. Turner, of Raleigh, N. C.; a Soft Palate Obturator, by Dr. W. B. McLeod, of Edinburg, Scotland; Dr. Genese's Anatomical Articulator, and his Syphon and Speculum.

Dr. V. H. Jackson, of New York, also had a large collection of appliances for regulating, with casts, models, etc.

Dr. J. J. R. Patrick, of Belleville, Ill., had a new catch for attaching a piece of tape to the rubber dam for each patient, in place of the elastic ribbon in use; also a shield for protecting the gums while trimming stumps for artificial crowns.

Drs. H. A. Parr, of New York; E. B. Call, of Peoria, Ill.; H. C. Merriam, of Salem, Mass.; T. S. Waters, of Baltimore; J. J. R. Patrick, of Belleville, Ill.; E. Parmly Brown, of Flushing, N. Y.; J. R. Knapp, of New Orleans, La.; S. S. Stowell, of Pittsfield, Mass.; E. T. Starr, of Philadelphia; J. S. Thompson, of Atlanta, Ga.; and S. Ludwig, of Chicago, gave clinics in crowns and bridge work. Dr. J. A. Daly was present with his all gold lining for vulcanite plates.

Dr. Younger, of San Francisco, Cal., Dr. Louis Ottogy, of Chicago, and Dr. G. L. Curtis, of Syracuse, N. Y., implanted teeth by the "Younger" method.

Dr. Geo. H. McCausey, of Janesville, Wis., and Dr. B. H. Smith, of Baltimore, used an aqueous solution ($\frac{1}{1000}$) of hydronaphthol, as a germicide and disinfectant in treating putrescent pulps.

Dr. J. P. Geran, of Brooklyn, N. Y.; Dr. E. S. Niles, of Boston, Mass., and Dr. C. A. Timme, of Hoboken, N. J., demonstrated the Herbst method, with the Wolrab gold. Dr. Geran also used cylinders and soft foil with Bonwill's mechanical mallet, in combination with the Herbst method, using 66 grs. of gold in building up a tooth, the cavity involving the whole of the masticating surface of a second molar.

Dr. E. L. Swartwout, of Utica, N. Y., used the Wolrab gold for lining cavities, packing with Watt's crystal gold.

Dr. B. H. Smith, of Baltimore, crowned four central incisors, cutting off the teeth, taking out the live pulps with broaches while benumbed or paralyzed by the shock, filling the roots and placing the crowns on the stumps at one operation.

Among the contour operators were Drs. R. F. Ludwig, who used Whitefield's electric engine, and Dr. G. S. Salomon, of Chicago, the latter using Kearsing's foil, with the Detroit Motor Co.'s battery motor and the Bonwill-Webb mallet; Dr. Wm. Crenshaw, of Atlanta, Ga., who made a series of eight or ten consecutive contour operations in the left upper jaw, restoring teeth which had been

severely cut away with files, etc.; R. H. Woodhouse, of London, Eng.; Dr. Sprengle, of Culpepper, Va.; Dr. M. C. Marshall, of Little Rock, Ark.; Dr. H. F. Harvey, of Cleveland, Ohio, using gold and platinum; Dr. G. H. Chewning, of Fredericksburg, Va., using Quarter Century foil; Dr. T. S. Waters, of Baltimore, using No. 30 Cohesive foil with the electric mallet; Dr. Wm. Barker, of Providence, R. I.; Dr. C. S. Carr, of Jackson, Mich., in filling a very large cavity used tin and gold, Robinson's felt foil folded together, and an articulating face of platinum gold; Dr. S. B. Price, of New York, using smooth point pluggers with soft foil; Dr. Hofheinz, of Rochester, N. Y., made a filling with cylinders; Dr. E. C. Moore, of Detroit, Mich., used Williams' soft foil cylinders; Dr. Geo. W. Whitefield, of Evansville, Ill., operated with Steurer's plastic gold; Dr. L. L. Davis, of Eaton Rapids, Mich., used the electro-magnetic mallet; Dr. H. A. Parr, of New York, demonstrated the value of his Universal Separator; Dr. R. B. Adams, of Gainesville, Ga., treated a number of cases of pyorrhea alveolaris by his new method; Dr. Wm. H. Richards, of Knoxville, Tenn., treated cases of antral abscess, and Dr. Geo. W. Whitefield illustrated his method of bleaching discolored teeth by passing a current of electricity through common salt, packed in the cavity, liberating chlorine, and thus setting free oxygen, the bleaching agent, in the tubuli. Dr. Shumway gave several clinics with his troary-pointed pluggers.

Interest in the clinics was unabated to the very last, several operations being performed on Saturday, the day after adjournment of the Congress. Indeed, the Franklin School building seemed to be the central point of interest of the section. As early as eight o'clock A. M. it was usually thronged, and the operators were at work, and from that time during the whole day, except the hours devoted to the sessions, it was difficult to make one's way through the crowded rooms. When the time came for opening the sessions, the officers and committees had hard work to stop the progress of operations, and the crowd lingered until after the last operator closed his case and took off his office coat. Foreign members of the section were especially anxious to witness the clinics of which they had heard so much. American dentistry was known to be intensely practical, and American operators to be the best in the world, full of original conceits and fruitful in ingenious devices. Many foreign dentists

had seen fine fillings that had been inserted in America, and were anxious to learn the exact *modus operandi*.

American dentists are always interested in clinics. They belong to a practical people, who have been chiefly engaged during the comparatively brief period of their national history in the solution of urgent industrial questions, and this has given a turn to national enquiry and experimentation. Dentistry in America was early thrown on its own resources, and obtaining no recognition from its scientific mother, Medicine, it at once became engaged in a struggle for professional existence, and that, too, has tended to make its character real and practical. It is little wonder, then, that from this national and international spirit of enquiry, and the known character for originality and inventive genius of American dentists, the practical part of the dental section of the Ninth International Medical Congress should have been of great interest. Nor did any one express any disappointment in the exhibitions. American operators are accustomed to work before an audience, and habituated to the necessary explanations, and the clinics maintained their attractions to the last.

Of all the demonstrations of operative dentistry, perhaps nothing attracted more universal attention than implantation. It was exemplified by Drs. Younger, Ottofy and Curtis. Dr. Younger, as the one who introduced it to the profession of to-day, and who has enjoyed greater experience in it, was, of course, the first favorite. He is a dashing, daring, brilliant, rapid operator, of striking appearance and confidence-begetting mien. Perhaps his operations were not more skillfully conducted than those of the others, but the interest centered in him, and a number of members of the Section of General Surgery attended his clinics, and gave the operation close attention.

The exhibits of the different dental depots also attracted great attention, especially from the foreigners present. There were so many ingenious helps that were new to them, and so much of American methods of practice could be studied from an examination of the implements with which they performed their wonders, that the rooms of the principal exhibitors were constantly crowded. The small army of the employees of the S. S. White Co. especially, were kept constantly busy in answering questions and explaining appliances.

The gold exhibit of R. S. Williams attracted universal attention, and his display was much admired.

The display of Seabury & Johnson did not receive the attention which its just merits demanded, for it was not in a conspicuous location. The exhibit of the appliances of Dr. Parsons, of Wamego, Kansas, was in the same room, and that too did not get its just deserts.

In addition to the American exhibitors, the great house of C. Ash & Sons, of London, who have a branch house in New York (as indeed they have in most of the important dental cities of the world), showed a large stock of their manufactures, and it was very instructive to compare English with American instruments. Sometimes this was greatly to the advantage of America—and sometimes not—but to the practicing dentist the benefit was the same, whichever might claim superiority.

The rooms of the other exhibitors named in this report were constantly thronged, and the displays much admired. There was not one which did not have some special features of interest that attracted the attention, not alone of the dentist, but of the members of other sections, and of the non-professional visitor as well.

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

REGULAR MEETING FOR OCTOBER, 1887.

REPORTED FOR THE INDEPENDENT PRACTITIONERS.

A paper was read by Dr. E. S. Niles, of Boston, upon "Dead and Diseased Teeth and their Treatment," (see page 230). During the reading of the paper the author referred to charts illustrating the subject, and he explained them as follows—

The pulp having died, the infective matter has found its way out into the tissues, and they have become inflamed and irritated. Suppuration ensues, gases are formed, and finally the pus burrows to the surface here (referring to drawing). This is a condition that I understand is called alveolar abscess. In a case of this kind the diseased condition may go on to that extent that the alveolus itself becomes diseased, dead bone is formed, and it is necessary to cut it away.

I have never seen but one case in which the extraction of the tooth did not eradicate the disease, and I have come to the conclusion that although the alveolus is affected, the tooth is the cause of the trouble. If the extraction of the tooth cures the disease, it evidently comes from the tooth; and if the tooth is hermetically sealed the tissues will tolerate it, and it will become a useful organ.

If we allow arsenic to get to the end of the root it will always cause trouble. If I get to the end of a tooth in which the pulp is alive with my broach, when I withdraw it there is usually no inflammation following. The pulp heals over when no arsenic has reached that point. I cannot see any of the root, yet theoretically that is the method that should be pursued. I know that a great many are inclined to make a free opening. I always fear an opening of that kind, where wounded tissue will be left and a condition be set up that would cause inflammation.

Merely wiping the canal with cotton is hardly sufficient to dry it into the dentine to any extent. It is often forgotten or overlooked that the dentine itself takes up the infectious matter, and that very often this matter may get into the canal, and this would not take place if it had been dried. I always dry as much as possible, both in filling and in antiseptic treatment.

Dr. Atkinson—I am apt to characterize things by the names that best suit them. I was never more astonished in my life than at the presentment that has been made to-night. If the essayist has really given us a synopsis of what he has done, or if this is his experience, he needs our sympathies. I should like to know what he means by a twenty per cent. solution and a five per cent. solution of bichloride of mercury.

Dr. Niles—A twenty per cent. solution is one consisting of twenty parts of bichloride of mercury and eighty parts of water, and a five per cent. solution consists of five parts of the bichloride and ninety-five parts water.

Dr. Atkinson—It will not dissolve at an ordinary temperature, or without some adventitious aid, and it leaves a precipitate, showing that the whole is not held in solution.

What becomes of pulps that are senile? The senile condition is a minified blood circulation and an increased calcareous deposit, that has many modes of expression. All those who have extracted teeth of old persons will remember that the roots are nearly as

transparent as glass, showing that the red blood no longer circulates in the remnants of the pulp-chamber that is always found on the side of the deposit of secondary dentine. The metamorphosis that occurs is toward the embryonic condition, and it is not such that the pulp cannot die till there is a microbe there.

Let us follow this pulp business. The chances are that in the case cited there was an excessive quantity of lime-salts present, and if you have the ability to drill through and let out the pus you will be able to restore the tooth, by proper treatment, to a healthy condition without loss of the pulp. I have found teeth that did well in that condition. The change that takes place in an exposed pulp is usually partial or complete atrophy, of which there are several kinds. There may be simple recession of the corium of the pulp, leaving the chamber dry and the balance of the bulbous portion of the pulp living; or atrophy may extend throughout the entire bulbous portion of the pulp, leaving the chamber full of a gelatinous mass of hyper-oxidized hydrate of carbon, with normal pulps in the roots; or it may die to the ends of the roots and be converted into a hyaline or jelly-like mass, where oxy-chloride has been used; or it may die by a conversion into an atheromatous condition, known as fatty degeneration, akin to what is seen in corpses under the name of adipocere. All these changes are odorless and benign. But where the return to the embryonic condition is so rapid as to initiate the metamorphosis of the tissue so rapidly as to disintegrate the embryonal corpuscles into pus corpuscles and set free ammoniacal and carburetted gases, the pulp is offensive to smell and needs extirpation; then after disinfecting such a canal, seal up and restore the contour of the tooth. If the gentleman can take out the fibrils in the tubuli of the canal, and disinfect the little canaliculi, I will thank him to instruct me how to do it. I have never known an instance where a fibril has been taken out in such a condition. Dr. Barrett said he had seen a solution of gutta-percha in chloroform ooze out from the tubules into the pericementum.

I have put four grains of bichloride of mercury into an ounce of water, and have always found a precipitate that was not dissolved, showing what was supposed to be the first point of saturation at an ordinary temperature. I have seen hydro-chloro-sulfate of albumen filling the entire pulp-chamber of a cuspid in the end of the root, and no evidence of disease whatever. I extirpated this, and

dressed it for a few days before filling. I would not do that again. I would immediately fill. I think nature knows a little of what she is about in these cases, and we should do just as she does; either take out the teeth, excommunicate or encyst them. All things that are encysted are absolutely excommunicated.

When you have taken out a pulp without going through the foramen entirely, there is where you get into trouble. Go through the foramen, and then wash out and treat it with water about as salt as sea water, or with the bichloride of mercury, or any of those agents that hold oxygen with such a loose grip, and you will be astonished to see how nicely it will get along. When a pulp is wholly dead it will be dead all the way around and through the canal.

Dr. Luckey—I cannot endorse all the methods that the gentleman has recommended. I think that in cases of dead pulps some antiseptic treatment is necessary, and that the practice of immediate root filling where there has been inflammation and abscess is injudicious. The proper treatment, in my opinion, is to clean out the canal and disinfect the whole thing, the abscess sac and also the canaliculi, and close up the external opening.

Dr. Atkinson—What is better than salt water for cleansing the canal?

Dr. Luckey—I think listerine is better.

Dr. Atkinson—It is useful as being a loose holder of oxygen. In the case of Daniel S. Dickerman there was half of a left superior central that was still good, the other half having broken down. There was a fistulous abscess that had continued for twenty-four years. It was cleaned out to the lingual border, bleached and filled, and in four weeks was sound, and has remained so.

Dr. Luckey—There are exceptions to all rules. One thing Dr. Atkinson taught me years ago, and that was to go through the end of the root with the drill, and if the experience of other gentlemen has been the same as mine, they have found it not to be safe practice. Our Swiss broaches are usually sufficient to get there. If there is an abscess, the probabilities are that the canal will be enlarged sufficiently to permit medicines to pass through, and if it is so enlarged it is a very difficult matter to fill it. I think the gentlemen present will bear me out in saying that there are a greater number of failures than successes in immediate root filling.

Dr. Stockton—This does indeed seem to be a live subject. The

Chicago Dental Society issued a pamphlet on the subject, and it was more fully discussed and excited more attention, both at Niagara Falls and Old Point Comfort, than any other; you remember that at our own State Society Meeting the same interest was manifested in the subject, and now again to-night, by way of Boston, it comes to us. In all these discussions of the last season I have been unable to reach a sure, definite mode of treating pulpless teeth.

I believe in removing pulps if they are exposed and have given pain, and I believe in doing so without the aid of arsenic. Open well the pulp-chamber, apply cocaine for a few minutes and then "knock it out." The pain is not very severe, and is very, very much preferable to the pain incident to the arsenic. The knocking-out is but for an instant, while the pain from the arsenic continues for hours, and even then the final removal is oftentimes as painful as the knocking-out. Then too, when the knocking-out process is used, the pulp-chamber and crown can be filled at once, and no after trouble is likely to ensue. In all cases, when there is a satisfactory opening, cleanse thoroughly and fill at once, and the opening will heal and the tooth become healthy, firm and useful.

In cases of blind abscess, I cleanse thoroughly, using a solution of bichloride of mercury 1 part to about 500 water for syringing the canal, and when satisfied that I have cleaned out all the dead matter I use the peroxide of hydrogen, and do so until there is no evidence of pus. Then after thoroughly drying the canal, I fill it with gutta-percha dissolved in chloroform, in which I have incorporated hydronaphthol, and if every step has been thoroughly done you can rest assured of very little future trouble.

The simple cleaning out of the putrescent pulp will in many cases bring about a cure. The tooth is so delighted to be clean that it at once gets well. If trouble should follow filling, then treat thorough the alveolus. But fill the roots. Many, very many teeth come to me abscessed because the dead pulp has never been removed and the root filled.

Dr. Osmon—Did I understand Dr. Niles to say that all diseased teeth belong to the fourth class?

Dr. Niles—That might be.

Dr. Osmon—That is a point that I wish to get clear to my mind. I have never met with any such tooth that could be demonstrated

as belonging to the fourth class. I have had to treat some. I want to raise my voice against long treatment. I also want to protest against immediate root filling. It requires some practice to know when to fill and when to wait. My own experience has led me to the conclusion that in the treatment of pulpless teeth it would be absolutely impossible to lay down any infallible rule. It has impressed itself upon my mind that after three or four treatments, if they have been thorough, you can safely leave it to the care of nature without fear of any further trouble. I believe the days of capping pulps have well nigh gone by. There are pulps that can be capped successfully, and if there are ever so many failures it is no reason why all should be failures. I have made such operations that have been successful, and I have many others where the pulp has gone the way of all flesh. I am glad that Dr. Niles has read this paper, for I believe there is no subject that opens a broader field for discussion than this one of dead pulps.

Dr. Palmer—I think Dr. Osmun and Dr. Luckey have given the impression that it would be wrong to fill at the first sitting.

Dr. Luckey—Yes.

Dr. Palmer—I think Dr. Luckey would not object to filling immediately in cases where the pulp has just been extirpated. I should do so in such cases. Dr. Luckey speaks of the canals or tubuli being filled with matter. Why cannot you disinfect them?

Dr. Luckey—Because you cannot force your medicine into the openings.

Dr. Odell—If it were a tooth in which you had extirpated the pulp, possibly you might have trouble. If you have nothing in this canal but a decomposed material, I do not see why you cannot fill it.

Dr. Luckey—For this reason; that the little tubules are filled with mephitic gases. You might disinfect the pulp-chamber.

Dr. Atkinson—It is simply a question of the arrest of the formation of gases, and you will always do that when you arrest the inflammation and seal up the canal.

Dr. Luckey—What becomes of the gases that are confined in the tubules?

Dr. Atkinson—They are so confined that they cannot kick. Put a pressure here, and as long as there is a tension from the incoming oxygen the fermentation will continue.

Dr. Luckey—Some of these fibers come in from the pulp-canal, others from the periphery of the tooth, and others from the pericementum.

Dr. Atkinson—They go crooked.

Dr. Palmer—There is a certain amount of life surrounding a tooth which it receives independent of the pulp, I admit.

Dr. Atkinson—When a tooth is not loose or tender, fill it.

Dr. Palmer—It seems to me that if these tubuli were filled with mercuric gases, the cleansing solution should be strong enough to disinfect them, although I am not enough of a chemist to explain the proportions. In cases where the pulp has recently been extirpated there should be no hesitancy in regard to immediate filling, and where there is a fistulous opening in the gum, it seems to me good practice to cleanse, disinfect and thoroughly fill at once, for nature will heal the fistula. I did so on Saturday in a case where the opening had existed for at least four years, and to-day the process of repair is going on nicely. I doubt very much the accuracy of Dr. Luckey's statement that there are more failures than successes following this treatment. I use iodoform usually, sometimes with, sometimes without, carbolic acid.

Dr. J. Bond Little—Mr. President and gentlemen, I came in so late that I did not hear all of Dr. Niles' paper. From the discussion that I have heard I think that there is a good deal of hair-splitting. In cases of fistulous opening I should simply pump through the foramen cariotic acid and disinfect the tooth, and then fill it. I have seldom any trouble with a tooth so treated. I would treat so long as there is any odor. I usually fill with silk, which I withdraw at the next sitting, and if there is no discoloration of the silk I proceed to fill. I think I can say that I save ninety per cent. of the teeth so filled. I do not think so much of gutta-percha filling as some do, for I find that when I take out the gutta-percha it has a bad odor. I prefer chloroide of zinc. I think it preserves the canal better and keeps it in a more aseptic condition. That is the treatment I have been pursuing for a great number of years. I do not think there is so much difficulty about it after all; the teeth usually get along, but sometimes I have trouble, owing to the constitutional condition of the patient. There is only one class of cases in which the teeth have caused me any trouble.

and that is teeth that have been broken by an accident, in which case I use the treatment of Dr. Howe, and fill with iodoform.

Not having heard all of the paper I cannot speak of it very intelligently. There is one point on which I cannot agree with Dr. Niles. I do not apply arsenic to aching teeth.

Dr. Niles—In going into the details of my treatment of the cases which have come into my hands, in no sense did I wish to imply that the same treatment was not used by the dentists of New Jersey. I was specially assisted by Dr. Herman, of South Boston, in the method of treating canals by the use of watch-spring broaches. They are much better, I find, than those which are generally used by dentists. There are several points that Dr. Atkinson has brought up. One as to the bichloride of mercury. He says the bichloride of mercury as now prepared cannot be dissolved in water. He seems to have made the mistake of taking calomel for bichloride of mercury. He has spoken of alcohol; alcohol will not dissolve albumen. As regards salt, it has no antiseptic power at all; it is simply a cleanser.

Editorial.

ANÆSTHESIA AND ANÆSTHETICS. NO. II.

The term anæsthesia primarily means privation of feeling, and an anæsthetic is an agent which produces loss of sensation. In this sense there are very many anæsthetics, not only in drugs, but among physical agents. Cold is an anæsthetic to warm blooded animals, and heat to those of cold blood. A severe shock or a blow upon the head may produce insensibility, or a serious injury to any organ may bring about a local loss of feeling. But in a medical sense, only those drugs which have a specific action upon neural tissues or functions are proper anæsthetics, and the use of the term is usually restricted to a small class of remedies whose action upon other tissues is either comparatively unfelt or brief in its duration. They are divided into general and local agents, according to the extent of the effects produced by them, and the manner of their application. Yet a true anæsthetic always acts in the same general manner, whatever may be the extent of the influence produced by it. Thus we believe that the same general laws apply to cocaine

that dominate the influence of chloroform. Both act by a direct impression upon the neural tissue.

A general anæsthetic produces its effects by systemic diffusion. All general remedies must be taken into the circulation, and thus carried to the tissues. To obtain any definite results from a general remedy, enough of it must be existent in the blood at one time, and in whatever manner it is administered the prime object is to get it into the circulatory fluid. This may be accomplished by direct injection into a vein by means of a hypodermic syringe, by rubbing it upon the skin and thus inducing its absorption, by ingestion and the consequent taking up by the lacteals, by enemas and absorption from the intestines, or by inhalation of vapors which are thus taken into the pulmonary circulation, the manner of administration depending largely upon the character of the agent. As anæsthetics are usually of either a gaseous nature or very volatile, they are commonly given by the latter method. There is also the advantage of a direct entrance into the circulation, which is secured in the pulmonary cells, as also the avoidance of gastric complications, which might arise were the agents given by the stomach. A vapor which is breathed has a more direct effect than by any other administration, if we accept direct injection into the circulation. Once in the blood current, the agent is carried to every organ, and to the remotest tissues.

The attempt to determine in what precise way an anæsthetic produces its characteristic effect has so far been a failure. Many experiments have been conducted by the most expert physiologists of which the world has any knowledge, and the main results have been only the multiplication of theories. Claude Bernard believed that he had established the fact that it was by a coagulation of the protoplasmic elements of neural matter. But this has not been accepted by others, who have made a special study of the subject, some of whom believe that in certain agents it is by depriving the tissues of oxygen, while others claim that there is a hyper-oxygenation.

Prof. Anstie believes that it is through a modified blood supply, or by some changes induced in the nutrition of nerve tissue. Whatever the process may be, the result is a modification of nerve function, and this exactly describes what an anæsthetic is, and gives us a general definition of an agent which has a specific power to modify or suspend the transmission of sensory nerve currents. To say

that these agents modify or suspend nerve function does not give a perfect definition, for there are drugs which suspend motor nervous impressions without special interference with sensation. Woorari deprives animals of the power of motion, while sensation remains almost or quite intact. In many respects it seems to be the direct antithesis of an anæsthetic, and to produce its effects in a decidedly opposite manner.

A true anæsthetic, then, paralyzes sensor-nervous tissues, or in some way makes them incapable of conducting sensor-nervous impressions. Whether its effects are primarily upon the nerve centers or upon nerve filaments, is not yet determined to the satisfaction of all. To our apprehension the action must be first on the terminal points, for a number of reasons. If it be primarily upon the great ganglia, we should have an influence which would be more nearly instantaneously felt throughout the whole body, and it would paralyze both sensor and motor fasciculi. Its influence would first be manifest upon the nervous centers, and its rate of progression would be far different, for the fact is that the influence of all anæsthetics is from without inward. The first symptoms are manifest and the first effects are felt at the terminal nerve filaments, and the progress is from the extremities toward the ganglionic centers: In this respect it is directly opposite to Woorari, whose primary influence is upon the nervous centers and its progress toward the termini.

The influence or progress of anæsthetic effects could not well be otherwise than from the peripheries toward the nervous centers, from the fact that it is felt only by the sensory nerves, whose office it is to convey, toward the central intelligence, the impressions or undulations received at the outposts. They have no power to transmit impressions from within outward, since the seat of sensation is at the great nervous center. The motor nerves lead outwardly, and are used in response to the information conveyed by the sensor trunks and filaments. If, then, our theory be correct, that the great ganglia, the nervous centers, have for a part of their office the transference of that form of energy which is the result of the molecular changes which we call digestion and nutrition into nerve force, we can better comprehend the physiology of anæsthesia. It is not an arrest of the elimination, but of the conveyance of nervous impulse. It is not of itself fatal, since it does not suspend vi-

tality, only modifying certain manifestations of it. It necessarily causes death only when, having overcome all the outposts, it has cut off the inner citadel from every communication, and is enabled to lay its icy hand upon the involuntary system.

There is another reason why the influence of anæsthetics is from without inward, and it may be found in the fact that it soonest reaches the periphery. It is carried in the blood-current directly to the capillaries, where it first comes in contact with the nerves, the final filaments of which are in immediate connection with the arterioles, and are the first to receive the influence. The progression of sensory impulse has been carefully observed, and its rate been found in man to be about two hundred and fifty feet per second, while in frogs it is but about eighty. It can readily be comprehended, then, that the determination of the progression of the anæsthetic influence may as easily be ascertained as was that of the undulations of nervous impact.

(TO BE CONTINUED.)

THE DENTAL ENGINE.

While the dental appliances of the day have in some respects simplified practice, in others they have complicated it. It is a mistake to suppose that a piece of machinery can be made to supply a lack of skill on the part of the operator. It may make practicable an operation that was impracticable before its invention, but it requires a greater amount of skill and dexterity, for there is the demand for the added knowledge required to run the machine. All the costly appliances of the dentistry of to-day are but entanglements, unless the operator knows how to employ them to the best advantage. There is little doubt that the dental engine has been the cause of the loss of many teeth; not through any fault in the machine, but because of improper and unskillful use. The dentist who has been accustomed to work with a hand-drill, for instance, when he takes in hand the engine, is not prepared for the rapidity of its action, and before he knows it he has sacrificed tissue that should have been saved.

It is a fact, too, that when an operator has, for a time, been working with dull burs and changes them, unless he uses the most extreme care he will, if working in soft dentine, do mischief before he is aware of it. After all, there is nothing like the old fashioned

excavator for conscientious work. No cavity should be wholly prepared by means of the engine bur. The rapidly revolving point conveys no sensation to the brain of the dentist. With it he cannot feel the exact line between sound and unsound structure. The necessary tremulousness of a point in rapid revolution destroys all delicacy of touch.

Necrosed bone is distinguished from sound by its peculiarly gritty and grating sensation beneath a metallic point. But it is impossible accurately to detect this with a revolving bur. So the softened dentine within a cavity of decay cannot be detected with the engine. The bur is excellent for cutting out decayed tissue, but it should always be directed by a probe which has explored the way before it. The excavator should be substituted for the bur at every step, and with it the diseased tooth-bone should be clearly defined. This being cut out, the engine should stop until a further examination has been made. In this manner the danger of cutting away too much is avoided, and the work is intelligently done.

Let any dentist who is accustomed to do all his excavating with the engine go carefully over all the surfaces of a cavity that is supposed to be ready for the introduction of the filling, and he will often be very much surprised at finding softened dentine where he had supposed it all removed, and he will perhaps have made clear to his apprehension the cause for certain hitherto inexplicable failures. Use the engine, by all means, but not without the aid of the exploratory excavator.

DOGMATISM.

It is astonishing how arrogantly and authoritatively some men will express themselves upon matters of which they are entirely ignorant. They get in the habit of doing a thing a certain way, and because that is the only manner with which they are acquainted, they loudly denounce every other method. We once heard a dentist declare that it was impossible to properly mix plaster of paris unless the plaster was added to the water instead of the water to the plaster. And yet, a little calm reflection should convince any one that it matters not which is placed in the bowl first. The only essential is thoroughly to incorporate the two so that the water of crystallization may be properly taken up by the dry powder.

We once heard an excellent operator dogmatically declare that in no case was it necessary, or even expedient, to place the rubber dam over more than two teeth in filling any cavity—that to include more was a wicked waste of time, dam, patient and operator. He admitted that he had never tried more—did not need to; he could succeed perfectly without. If a dentist will try the plan of including two teeth on each side of the cavity to be filled, he must be convinced that there are times when it will greatly add to his convenience and the perfection of the operation.

Nothing will convince some men that there can be a better way than their own. A dentist once informed us that there was no implement fit to mix plaster with except a tablespoon, and to sustain his position he said that a spoon was naturally intended for mixing purposes, for the concavity of the bowl produced rotary currents in the mass to be mixed, which insured a thorough commingling of the particles. When reminded that a spoon was inconvenient for building up the plaster, he said he could do that well enough with his fingers. In dental society meetings this dogmatic assurance is constantly bubbling up, and men who, perhaps, are the least qualified for the task, deliberately set about the instruction of their colleagues in the most rudimental of techniques, dwelling upon particular methods to the total exclusion of principles and mechanical laws, and upon mere methods to an end waste time which should be devoted to a better purpose.

DEVITALIZING PULPS.

There are few things in dentistry that are so often unskillfully done as the application of arsenical paste for the devitalization of pulps. We believe that much of the pain of which so many operators complain as attendant upon this process, is due to the wretched manner in which the agent is too often used.

In the first place, perhaps the rubber-dam is not applied, but the saliva has almost unchecked entrance into the cavity and the paste is not left in proper position, even if it be not altogether washed out. All manner of debris is left in the cavity to obstruct the rapid action of the agent, and to cause an unnecessary irritation. The paste is not applied directly to the pulp, but is placed almost any-

where, so that it will be in contact with the tooth, and lastly, it is, perhaps, covered with cotton dipped in that abomination—a sandarach solution. What wonder that the results are unsatisfactory.

For the proper devitalization of a live pulp it is essential that the agent be placed in immediate contact with the pulp. All debris and loose particles should be carefully removed, and this can best be done—in part at least—by thoroughly rinsing the cavity with warm water.

Excavation is not essential, but the taking out of all debris is. The rubber dam should be applied and the cavity dried as perfectly as possible. Then, the pulp being exposed completely at some point, a minute particle of the paste should be directly applied, covered with a small cap cut from thin rolled tin or some other metal, and made concave by pressure with the rounded end of an excavator, and the cavity carefully sealed with wax, gutta-percha, or some impermeable covering. We have found modeling compound an excellent material when warmed. If this course is followed, pain will be the exception and not the rule, and should it unfortunately succeed it will be very fleeting in its character.

When the pulp exposure is from attrition or fracture, and there is no cavity of retention, a small concave cap may be made of wax, the paste placed in it, and the tooth being carefully dried and the wax warmed, it may be made to adhere sufficiently long for devitalization.

If any one really wishes to raise a toothache that shall cause him to be remembered, let him put arsenical paste in a wet cavity, the pulp being covered with refuse matter and decayed dentine, and then let him cap the climax of the outrage by thrusting into the outer cavity cotton wet with a sandarach solution. This will permeate the whole cavity, encapsule the arsenical paste and prevent its action, while it serves as a constant irritant. In a few hours it will decompose, and the cavity will become foul almost beyond conception. We think it is really the worst covering for a temporary dressing of which we have any knowledge, and we have had experience enough with it to be an expert in judging its demerits.

Does any one think that the method here recommended is too troublesome? Well, if his practice of dentistry rests upon a desire to avoid painstaking and labor, our advice to him is to drop it and seek some less irksome occupation.

A DENTAL VERSUS A MEDICAL CONGRESS.

When the subject of an International Dental Congress was sprung upon the profession a couple of years ago, we urged that the question of the future trend of dentistry be carefully considered and definitely settled. Either we should agree in the drawing yet closer of the bonds which unite us to medicine, or we should sever them altogether. The overwhelming voice of the dentists of America proved to be in favor of a closer union with medicine, and we were committed to the support of a dental section in the Medical Congress. This having been done and our place thus assured us, we should not lightly throw off the obligation until the union with the mother profession has been given a fair trial at least.

The scheme for an International Dental Congress in Paris, in 1889, is necessarily hostile to the dental section of the Medical Congress, which meets in Berlin, in 1890. France will doubtless do what it can to defeat the Berlin meeting, because of the bitter feeling which she entertains toward the Germans—a hatred born of the Franco-Prussian war, and the loss of a part of her territory. Let us be careful how we commit ourselves as partisans for either side. If Paris desires a great dental meeting in 1889, well and good; only do not let us call it a Congress, or take such part in it as shall prove prejudicial to the Medical Congress with which we have cast our lot, and thus perpetuate the unfortunate divisions which marred the Congress of 1887.

Current News and Opinion.

CORRESPONDENCE.

Editor Independent Practitioner:—

I must say that I read that part of the report of the International Congress which was published in the March number of your journal, with a great deal of surprise. I cannot comprehend why an editor who is usually so fearless in attacking that which he believes to be false practice should allow such matter to be inserted without comment.

Dr. Cunningham, of England, especially, preaches some doctrines which I have always been taught to believe, and which I am fully convinced, are about as bad practice as can well be conceived. He says that "his practice with pulpless teeth is to remove the soft dentine, clearing out the pulp-chamber, but not the root canals. When the cavity is ready for filling, he places over the entrance to the canals a disk of paper saturated with arsenite in which ten or fifteen grains of arsenic has been dissolved. Over this he fills with oxychloride, and finishes the filling as desired."

He says that he usually fills all classes of teeth at one sitting, rarely seeing the patient again. Now if I should follow such a practice, I not only should not expect to see the patient a second time, but I should pray that I might not. If the leaving of a canal uncleansed and unfilled, with an arsenic preparation at its opening, is good practice, then certainly I have not been well taught, and if Dr. Cunningham's patients do not eventually curse the day when they placed themselves under his care, then there is no truth in pathology as usually taught in this country. If it be no matter whether or not broken drills be left in the tooth, and if dead teeth can be successfully treated and filled in half an hour, whence the necessity for spending three years in study? Such practice as that may be learned in a week. Indeed, it seems to come naturally to some dentists.

There were others who took part in that debate, some of whose utterances were, in my opinion, nearly as ill-advised and erroneous, and I cannot comprehend how you and others who were there allowed these things to pass without rebuke.

H. A. BIRDSALL, D. D. S.

The editor of this journal was not present at the final session, as he found that by the route over which he must return home no train left Washington between early Friday evening and Monday. Besides, he had already expressed himself, perhaps more forcibly than was necessary, and certainly much more so than he realized until he saw his remarks in print, upon this very question of root treatment. It was but fair that members who held views differing from those usually accepted should have their innings in turn, and that their opinions should receive respectful treatment at the hands of the reporters —EDITOR.

THE AMENDMENT TO THE DENTAL ACT.

The following bill has passed both branches of the Legislature of the State of New York. It will be seen that some of its provisions are of great importance. The bill has been considerably amended since its first introduction.

AN ACT

To amend chapter five hundred and forty of the laws of eighteen hundred and seventy-nine, entitled "An act to regulate the practice of dentistry in the State of New York."

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. Section one of chapter five hundred and forty of the laws of eighteen hundred and seventy-nine, entitled "An act to regulate the practice of dentistry in the State of New York," is hereby amended so as to read as follows:

SEC. 1. It shall be unlawful for any person to practice dentistry in the State of New York for fee or reward or to assist in the practice of operative dentistry as either agent or employee, unless he shall have received a proper diploma or certificate of qualification from the State Dental Society or from the faculty of a reputable dental or medical college, recognized as such by said society, and shall be duly registered and shall have received a certificate thereof, as provided

in section three of this act; provided that persons who were engaged in the practice of dentistry in the State of New York on the twentieth day of June, eighteen hundred and seventy-nine, who shall comply with the requirements of section three of this act, shall be otherwise exempt from the provisions of this section, and provided further that nothing contained in this section shall prevent a student who is pursuing a regular course of instruction from assisting a person in the practice of dentistry qualified as hereinbefore provided.

SEC. 2. Section three of said act is hereby amended so as to read as follows:

SEC. 3. Every person practicing dentistry within this State shall register in the office of the clerk of the county where his place of business is located, and in the office of the clerk of any county into which he shall remove his place of business, in a book to be prepared and kept by the clerk for that purpose, giving his name, office and postoffice address and the date of such registration, and shall, on presenting to the county clerk a certificate from the member of the State Board of Censors appointed by the State Dental Society for the judicial district in which such county is situated that he has received a proper diploma or certificate of qualification as provided in section one of this act, be entitled to register and receive a certificate of such registration upon payment to the clerk of a fee of fifty cents.

TRADE OR PROFESSION?

We have before us an address delivered before the Maine Dental Society, by Horatio C. Merriam, D. M. D., in which is discussed the question whether dentistry is a specialty of medicine or whether it is a trade. The distinction between trade and profession is presented in a manner which deserves a larger number of readers than is comprised in strictly dental circles.

What would be thought of Dr. Bigelow, the address asks, and how would his name go down in the history of medicine if he had asked or received from his brothers a royalty for each time they had performed his operation for stone, or sold his instruments so that they could be withdrawn from competing with those already in the market? Or even patented and received a revenue on their sale? Would a dealer even venture to approach such a man with a proposition to buy his instruments so as to control their sale? Yet these things are regarded as legitimate and proper in trade, but they are condemned in medicine, for the reason that methods honorable in trade may yet be discreditable in a liberal profession. The condition of the general medical profession as shown by such an example differs widely from the position of the dentist, and the author gives various examples of an opposite course of conduct. "A large house has acquired control of all patents on the dental engine, and is thus at liberty to manufacture such only as it may wish, and place its own judgment instead of the profession's." "A dental chair, the invention of a dentist, had been bought and withheld from the profession." "I heard within a few months of a dental piece that a manufacturer had bought for five years, and had then for five years prevented its coming into competition with those of his own make." "A short time ago I was told of a dentist who took to a manufacturer a form of work he had invented. The manufacturer looked at it, then squared a drawer and

showed by drawings that he already had the invention in his possession." "Many of our journals are published and controlled by dealers, and often contain articles in the text advertising materials for sale by their publishers. We often see recommended or offered for sale to the profession articles and medicines, the formulas of which are not given."

"Our dealers have also formed a combination and propose to decide who shall conduct our supply-business, whose gold they shall sell you, whose material they will or will not keep, through what firms you shall order their goods, and they are able to take orders for only such goods as the combination chooses to offer. They may have the power to interfere with the delivery of an instrument you have ordered if it infringes on a patent held by them."

The author then goes on to say that "they are perfectly right in all that they do or have done if dentistry is a trade and we are tooth carpenters The brother who sells his invention instead of bringing it before his Society is the one to blame, not the dealer who buys it and shelves it to his advantage. Surgical instrument makers would soon learn to do this if the medical profession would permit." The fact that the onus of such a condition is the fault of the profession and not of the dealers, is enforced by the question; What would be thought of a Cheever, or a Hodges, or any leading surgeon who would do such a thing as patent and sell his inventions? Yet it would be right if medicine were a trade and they repairers of the clavical and menders of femurs.

Now these extracts present so forcibly the distinction between a trade and a profession, that they may well be pondered by the medical profession at large. If at times it seems a little unfair that one's improvements on surgical apparatus should not directly bring in a fixed income, the opposite condition, when everybody should exact royalties and conceal the composition of all new drugs, is too horrible to contemplate—and between perfect freedom on the one hand and patents and copyrights on all new inventions on the other, there can be no middle ground. It is certainly entertaining and instructive to contemplate the unpleasant position which might be, were the general profession suddenly to overturn its present lofty ideal and become a trade.

It would be pleasant to believe the statement as to the position of the dentists an exaggerated one, but as a warning it is perhaps not useless nor entirely needless.

NOTE.—The above editorial from *The Boston Medical and Surgical Journal* is given a place at the request of one of the most respected members of the dental profession.—EDITOR.

AN INTERNATIONAL DENTAL CONGRESS.

The *Dental Review*, of March 15, 1888, in advocating the holding of "An International Dental Congress at Paris, France, in September, 1889," disclaims any intention of interfering with a Section of Dental and Oral Surgery in connection with the Tenth International Medical Congress to be held in Berlin, 1890. Notwithstanding this disclaimer, it is difficult to see how the editor of the *Review* could more directly and certainly interfere with the organization of an efficient and successful Dental Section of the International Medical Congress

in Berlin, than by persisting in his scheme of forestalling it by a separate International Dental Congress the year preceding in Paris. The full recognition of properly educated dentists by the successful organization of a Section of Dental and Oral Surgery, as a part of the great International Medical Congress at London, in 1881, and its repetition with still greater success as a part of the International Medical Congress at Washington, in 1882, leaves no room for doubt about the purpose of organizing a similar Section in the next Congress at Berlin, and of its permanent recognition as a legitimate department of the great field of medicine and surgery. Then why should not every enlightened member of the profession use his influence for perfecting the unity of all the departments, and the promotion of such harmony in the organization as will afford mutual support and mutual advancement. There is no interest, social, scientific or practical, to be promoted by an exclusive International Dental Congress in Paris next year, that could not be more efficiently promoted by a Section of the International Medical Congress the following year at Berlin. The published proceedings of a Congress of Dentists will reach but few outside of its own members, while the work of a Section becomes a part of the published transactions of the general Congress, and thus receives a wide distribution to members of all other Sections and vice versa the work of all other Sections becomes the property of the members of the Dental Section. So true it is, that co-operation and union impart strength and diffuse knowledge, while segregation and exclusiveness limit both.—*Am. Med. Ass'n.*

DR. A. M. HOLMES'S FLANGE PLATES.



The above cuts represent a form of plate which is intended for lower cases in which the alveolus is very much absorbed. The cuts were made from a plate which Dr. Holmes says is an exact duplicate of a practical case that has been in use for eight months, and has proved very satisfactory indeed. They do not represent it very well, except upon one side, but it should be comprehended that the flange extends entirely around the inside of the plate. The upper side is concave, and in the concavity the tongue rests and holds the plate in position. The only difficulty in making such a plate is to determine just where to place the flange so that it shall not irritate the gastric and hyoid gland openings. It should

be placed as low as possible. Dr. Holmes says that a plate properly made in this way has been entirely serviceable in a mouth in which every other form had proved a failure, and his experience is that in many cases it will be found superior to any other. It is sometimes extremely useful in partial plates, which can thus be made thinner and lighter than by the usual mode of construction. The method of forming the flange will readily be comprehended from the cuts.

A BREATH OF SPRING.

The practitioner in a large city who is closely confined to his office work knows no Spring, and has little personal appreciation of the change of seasons save in the mere modification of temperature. Seeing little out of doors besides brick walls and stone pavements, he has no sense of the awakening of a world from the winter's trance, aside from his general participation in the universal uneasiness and unrest, until perchance at an unexpected moment he meets with a new birth of nature, a tender youngling but just entered upon a season's existence, and feels his own inner nature expanding in sympathy with the opening buds.

A well-known dentist who lives in the picturesque regions of Pennsylvania, in memory of old times and of old friends whom we shall meet no more on earth, each year sends us a box of that delicate harbinger of the coming summer, the beautiful Trailing Arbutus. He knows only too well the memories which it awakens, and the tender recollections of the long ago which come thronging back at sight of the exquisite tints of this favorite of the early spring.

“ Old wood to burn ! Old wine to drink !
Old authors to read ! Old friends to trust ! ”

AN EXPLANATION WANTED.

“ Why is it,” inquired a lady, recently, “ that a sea voyage destroys gold fillings in the teeth ? ” “ My husband,” said she “ had his teeth put in perfect order preparatory to a trip to Europe, but when he reached home all the fillings had disappeared. He called again on his dentist to have them refilled, and asked why the fillings came out. He was informed that the mischief was due to the sea voyage, which, in some unaccountable manner, loosened the gold. His dentist stated, also, that he had known of quite a number of similar occurrences among his patients who had crossed the ocean. Whether it was due to the salt atmosphere or the motion of the vessel, he could not say.” We wonder which !

F.

THE THREE HOTTEST DAYS IN 1888.

In his article on “ Where to Spend the Summer,” in *Scribner's* for April, Gen. Greely, chief signal officer, makes a prophecy as to the hottest days in the year 1888. The *Detroit Journal*, taking the matter up, has offered a prize of \$500 to the person guessing correctly, before June 1st, what the three days will be. Gen. Greely immediately telegraphed his guess to the paper, in accord with his reasons in *Scribner's* for April

CHICAGO COLLEGE OF DENTAL SURGERY.

During the College year just closed, one hundred and twenty-six students were matriculated. The commencement exercises occurred Tuesday, March 25th, at 2 30 p. m., at the Grand Opera House. The Faculty address was delivered by Prof. Truman W. Brophy, and the class valedictory by Dr. A. H. Fock.

The degree of D. D. S. was conferred upon the following gentlemen:—

John Wesley Andersson.	Thomas Francis Henry,
John Charles Barclay.	Richard Herrmann.
George Heinrich Becker.	James Ward Howe,
Clayton William Bennett.	Henry K. Kemoko.
Orrin George Bennett.	Richard Kessel.
Frank William Cady.	William Kuester.
Sherman Lee Chappell.	Louis Frank Lathan.
Frank Beaumont Clarke.	George Edward Long.
Rush Eugene Crissman.	Alfred Loewther.
William Gould Dalrymple.	Anthony Mann.
Charles Henry Darling.	Clare Winchell Marshall.
Frank Henry Davis.	Edward Martin McIntosh.
Samuel Finley Duncan.	Charles James Merriman.
William Andrew Fortuin.	Ewing Van Dusen Mason, M. D.
Clarence Barnard Freeman.	Hans Thorsen Nordahl.
Robert Curtis Gardner.	Adelbert Henry Pock.
Thomas Duma Gardner.	George Roddy.
Grant Arthur Goodrich.	Frank M. Russell.
Valentine Arthur Gulex.	Harry Reid Staler.
Alfred Ward Hebert.	Henry Stewart.
Peter Monroe Hendershott.	Rupert DeGeorge Tison.
Albert Frank Henkel.	Samuel Adolphus Whellan.

FIRST DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK.

At the annual meeting of the above society, held Tuesday evening, April 3, 1888, the following were elected officers for the coming year:—

President—W. W. Walker.

Vice-President—J. F. P. Hodson.

Secretary—B. C. Nash.

Treasurer—John L. Hart.

Librarian—J. Bond Lattig.

Board of Censors for Five Years—A. L. Southrop, Frank Alden W. G. Torry, William Carr and A. R. Starr.

Delegates to the State Dental Society for Five Years—J. W. Taylor and B. A. R. Ottolengui.

B. C. Nash, Secretary.

PENNSYLVANIA STATE DENTAL SOCIETY.

The twentieth annual meeting of the Pennsylvania State Dental Society will be held in Philadelphia, Pa., Tuesday, June 5th, 1888. Session to continue for three days.

Wm. D. Miller, D. D. S., Sec. Soc'y.

NATIONAL DENTAL ASSOCIATION, U. S. A.

The National Dental Association of the United States of America will hold its next regular meeting at Washington, D. C., July 24, 25 and 26 1888.

For this meeting, as for all former ones, the authorities of the Smithsonian Institute have kindly granted the use of the Lecture Hall of the U. S. National Museum.

All members of the profession in good standing are invited to be present.

Art. II, Sec. 1 of Constitution.—The future membership of this Association shall be composed of dentists who may be elected upon application, which application shall be accompanied by credentials of membership in a State Society, or by a recommendation from five members of this Association, or of his State Society.

R. FINLEY HUNT, D. D. S., Sec N. D. A., U. S. A

CHICAGO DENTAL SOCIETY.

At the annual meeting held on Tuesday evening, April 3, 1888, the following named persons were elected officers for the ensuing term :—

President—J. A. Swasey.

First Vice-President—J. W. Wassall.

Second Vice-President—W. B. Ames.

Recording Secretary—C. N. Johnson.

Corresponding Secretary—Louis Ottofy.

Treasurer—E. D. Swain.

Librarian—A. W. Harlan.

Executive Committee—Edmund Noyes, Geo. H. Cushing, J. N. Crouse.

LOUIS OTTOFY, Cor. Sec.

DR. E. L. TOWNSEND, of Los Angeles, Cal., says, in the *Southern California Practitioner*, that after quite an extensive examination of the teeth of the Chinese, he feels sure that the statement lately made that there are never any irregularities in the teeth of the Chinese, is based upon anything but actual observation. A regular denture among them is more of a rarity than among the whites. In meeting them upon the street the various irregularities are constantly observed, and upon closer examination all the diseases common to the whites are found. Dr. Townsend has observed all forms of irregularity, and is fully convinced that irregularities of the teeth are as prevalent with the Chinese as with any other race. The editor of the *Southern California Practitioner* confirms Dr. Townsends observations.

THE SOUTHERN DENTAL JOURNAL in view of its late discipline of pillaging editors (every word of which we heartily approved), should be extremely watchful of its own pages. The last number contains an instance in point in which its own rule is not only broken, but additional injury is inflicted by disguising an extract from an article in this journal by a false head.

We do not mean to imply that this was anything more than carelessness on the part of our usually scrupulous contemporary, but it shows how even great Homer may nod, and that with the best intentions one may err.

THIS SEEMS TO BE the day of tooth-matrices. In the advertising pages, one of one which is offered to the profession by Dr. C. Steadfast Smith will be found, which is not only effective, but cheap and simple. The band for this device is manufactured for the case in hand, and is cut from Taggart's tin. This material has some advantages that are peculiar to it. The band may easily be cut so that it will exactly fit the tooth. If the latter be bell-shaped the band can be cut longer upon one edge than the other, and thus embrace the tooth closely at both cervical and masticating borders. The band being made of a bright reflecting metal, it helps to illuminate the cavity. A single fastening clamp will serve for almost any tooth, and the adaptation can always be depended upon.

TO REMOVE IRON RUST.—It is often very difficult, and sometimes impossible, to remove rust from articles made of iron. Those which are most thickly coated are most easily cleaned by being immersed in a nearly saturated solution of chloride of tin. The length of time they remain in this bath is determined by the thickness of the coating of rust. Generally twelve to twenty-four hours is long enough. The solution ought not to contain a great excess of acid, if the iron itself is not to be attacked. On taking them from the bath, the articles are rinsed first in water, then in ammonia and quickly dried. The iron when thus treated has the appearance of dull silver. A simple polishing gives it its normal appearance.—*Popular Science News*.

IN FRANCE druggists are not allowed to sell "toxic drugs," which include chloroform and preparations of opium, to dentists, except upon prescription of a physician, health officer or veterinary surgeon. It is not yet decided whether cocaine is to be included in the taboed list.—*Pharmaceutical News*.

And so French law places dentists below horse doctors! Is it because the well-being of Frenchmen is of less consequence than that of French cattle, or because French dentists are believed to be less intelligent and well informed than their horse doctors?—EDITOR.

DR. W. B. MILLER, of Altoona, Pa., sends us a matrix that in some respects is a decided improvement upon the usual band matrix. The screw which drives it tight is a thumb-screw, and upon the end which bears against the tooth is a safety block or plate which fits against the tooth firmly, and is held in exact position by guide-pins. As a consequence it is easily placed in position, and is not at all liable to slip, while it obviates the danger of fracture of tooth walls by pressure. Dr. Miller has also devised a disk-case in the form of a cylinder, in which sandpaper disks are held, one being presented for removal at a time. When this is removed a spring pushes the next one into its place. It is very convenient.

"PRAY SEND for the best operator for the tooth at Thessalonica, I suppose, there is some famous one, and let him put yours in perfect order, and then take care to keep them so afterwards, yourself."—*Pope's Last Chronicle's letter to his son, May 15, 1742.*

PARKE, DAVIS & CO., of Detroit, have perfected a set of hypodermic tablets which will prove extremely useful to all who desire to use aconite, atropine, cocaine, morphine, strychnine and other remedies hypodermically. They are put up in bottles containing twenty-five tablets, each having the proper amount of the remedy for a single dose. The tablets instantly dissolve in water, and form a perfectly limpid solution. Parke, Davis & Co. also furnish a hypodermic case containing their latest improved syringe, with points, and six bottles of the tablets in most common use. Full information may be obtained by writing the firm and mentioning this journal.

THE FIFTH DISTRICT DENTAL SOCIETY at its annual meeting held in Utica, April 10th and 11th, unanimously voted to request the concurrence of the members of the Sixth, Seventh and Eighth District Societies in a Union Meeting to be held in Syracuse, in October next. The Union Meetings of the Societies named that have been held in the past have been very profitable and pleasant, and there is no room for doubt that the Fifth District will treat its guests with the same consideration that the other Societies have shown.

DR. AND EX-SENATOR A. M. HOLMES, of Morrisville, N. Y., sends us a sole-leather disk which is the most effective and perfect polisher for the borders of approximal fillings that we have met with. It is evidently cut from a piece of sole-leather, a hub being left in the centre to give the mandrel point a good hold, but how it is made or whether the Senator will furnish them to others we have not as yet been able to find out. He has, he says, been using them for a number of years.

THE DENTAL SOCIETY OF THE STATE OF NEW YORK will meet in Albany, on Wednesday and Thursday, May 9th and 10th.

As the Society does not send out the usual advance notices for publication in the journals, and as the programme was not received until the forms for our May number were made up, it is impossible to present more than this notice, but a good meeting may be expected.

TINCTURE OF IRON when diluted with water has a very corrosive action on the teeth, owing to the free acid it contains. This should be neutralized by using for the diluent an alkaline mineral water like Vichy, or else alcohol or a syrup should be used as the vehicle. The latter is of course preferred. The so-called tasteless tincture does not have the same injurious action on the teeth.—*Pharmaceutical Era*.

A BROKEN FRIENDSHIP may be soldered up, but it will always show the break. You can impose on an enemy and it will be nothing more than he expects; but an imposition on a friend is never forgotten or forgiven.

MARRIED.—On Wednesday, April 25th, at the residence of the bride's parents, Miss Nannie Bell, daughter of Dr. and Mrs. J. G. Templeton, of Pittsburgh, Penna., to Walter M. Lindsay.

THE FIRST DISTRICT DENTAL SOCIETY will hereafter meet at the rooms of The Academy of Medicine in New York City, upon the first Monday evening of each month.

THE Independent Practitioner.

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JUNE, 1888.

No. 4.

NOTE.—No paper published or to be published in another journal will be accepted for this department. All papers must be in the hands of the Editor before the first day of the month preceding that in which they are expected to appear. Extra copies will be furnished to each contributor of an accepted original article, and reprints, in pamphlet form, may be had at the cost of the paper, press-work and binding, if ordered when the manuscript is forwarded. The Editor and Publishers are not responsible for the opinions expressed by contributors. The journal is issued promptly, on the first day of each month.

Original Communications.

PATHOGENIC BACTERIA OF THE HUMAN MOUTH.

INTRODUCTION.

BY PROF. W. D. MILLER, BERLIN, GERMANY.

In point of temperature, culture-material, moisture, etc., the fluids and accumulations of food in the human mouth present the best possible universal medium for the development of bacteria, both pathogenic and non-pathogenic. We should accordingly expect that among the many different kinds of bacteria that are continually entering the oral cavity, either with the food or air, pathogenic kinds may be included, and that these may proliferate for a certain length of time, or may even establish themselves as permanent occupants of the mouth. Many facts point to the truth of the statement that pathogenic bacteria may be present in the mouth without manifesting themselves in any other way than the ordinary parasites of the oral cavity, as long as the mucous membrane remains intact. If, however, the resistance of the soft parts has been impaired by any constitutional cause (scorbutus, syphilis, etc.), a *locus minoris resistentiæ* will thereby be created, at which the bacteria may manifest their specific action in local inflammation, sup-

puration, etc. Or if the continuity of the soft parts has been destroyed, as in tooth extraction, wounds of the mucous membrane, etc., an entrance into the blood or lymph vessels is thereby provided, which may lead to still more serious results (abscess, pyæmia, septicæmia, etc.).

In this manner, I am convinced, many of the diseases of the gums and contiguous parts (not excepting pyorrhœa alveolaris, as I shall endeavor to prove later), as well as the majority of the infections following tooth extractions, are to be accounted for.

It is only within the last few years that dentists and physicians are beginning to understand the importance of the human mouth as an incubator for bacteria, and the disastrous results which may follow the neglect to keep the mouth in a proper condition, placed as it is at the entrance of the digestive and respiratory tracts, communicating with so many contiguous cavities, and so often the seat of minor surgical operations which permit of infection.

Every tooth extraction which is not performed under antiseptic precautions is nothing less than an inoculation, and whether the subject proves refractory or not will depend upon a variety of circumstances, as the size of the wound, the resistance of the parts, the character and number of bacteria entering the wound, etc.

Parré (*Dental Record*, October, '87) reports a case of chronic pyæmia which originated in a diseased wisdom-tooth. Poncet (*Gazette des Hôpitaux*, No. 19) describes a case of osteitis, which, originating in a carious tooth, led to a general septic infection, terminating fatally in forty-eight hours. Tripp (*Dental Record*, August, '87) observed a case of inflammation of the brain following an alveolar abscess. Ritter (*Deutsche Monatsschrift für Zahnheilkunde*, August, '87,) a case of septic blood poisoning from a carious tooth, terminating fatally, and Mosetig-Moorhof (*Oest.-Ung.-Vierteljahrsschrift*, January, '87), a case of fatal osteomyelitis following extraction.

Dental literature furnishes a large number of cases in which death, owing to infection, has occurred from one to ten days after extraction of a tooth. Naturally, however, not all cases of infection have so severe a character, in very many cases remaining localized, giving rise only to a slight swelling or suppuration of the parts, or by no means unfrequently to severe purulent inflammation, osteitis, necrosis, etc. Such cases must be familiar to every one; in fact,

where resection of the alveolus is practiced, extraction of a root in an unclean mouth without the observation of antiseptic precautions will, in nine cases out of ten, be followed by more or less inflammatory reaction of a septic nature.

The wounding of a finger by an instrument just used in a dirty human mouth may prove a very serious matter, as I can testify from personal experience, having been confined to my room for two weeks by an exceedingly painful lymphangitis and phlegmon of the hand, contracted in this manner. Scratching the finger on a sharp root in an unclean mouth has produced much more serious results.

Many years ago Leyden and Jaffe pointed out that the bacteria which are found in the mouth, even in a state of perfect health, may, under predisposing circumstances, give rise to severe lung diseases; also James Israel, who has given much time to the study of the transportation of bacteria from carious teeth, describes a number of cases of abscesses on the neck, chronic pyæmia, etc., in which he was able to find the primary source of infection in the mouth. The oral cavity, when it is allowed to become the seat of extensive parasitic vegetation, may also have a most deleterious action on the general health, leading to concomitant affections of so severe a nature that the primary affection may be, and very often is, entirely overlooked by the physician.

A series of interesting communications dealing with this question were made by Von Kaczorowsky (*Deutsche Med. Wochenschrift*, 1885, 33-35).

After several years of practical experience and a long series of observations, Von K. came to the conclusion that many cases of loss of appetite, nausea, dyspepsia and consequent general ill-health, were to be attributed to an unclean condition of the oral cavity, independently of the condition of the teeth themselves. Acting upon this conclusion he was able to treat such cases with marked success by simply insisting upon repeated cleansing and sterilization of the mouth and throat.

“When we take into consideration that affections of the mucous membrane of the mouth may *per continuitatem* spread over the whole mouth and throat, and thence upwards and downwards over the respiratory and digestive tracts, through the Eustachian tube to the internal ear and brain, from the nose

through the lachrymal canals to the eye, through the sieve of the ethmoid to the membranes of the brain; furthermore, when we remember that the irritation of the terminal branches of the quintus in the gums may produce irradiations in other branches of this nerve or irritations in near and distant organs of the body—” * when we keep all these things in mind, and remember at the same time that many people, as Von K. rightly says, carry about constantly an amount of filth in the mouth which they would not tolerate for a moment upon the skin, then we can readily account for many troubles which otherwise appear inexplicable and stubbornly resist every treatment by the usual internal remedies.

Individuals whose teeth are in a state of almost complete ruin, whose gums are swollen and suppurating, whose breath testifies to the intense fermentation (in some cases putrefaction) going on in their uncleaned mouths, receive one prescription after another, or are sent from one bathing place to another to no purpose whatever, when a thorough cleansing and disinfection of the mouth, accompanied by the necessary dental work, would restore them to health in a very short time.

Up to the present time very few attempts have been made, in cases of severe infection through the oral bacteria, to cultivate the specific bacterium by which the infection was brought about, and indeed a very grave hindrance is opposed to the study of the bacteria and bacteritic affections of the mouth, in the circumstance that such a large number of different kinds is to be found, and that many of the oral bacteria are not to be cultivated on any of the artificial media at present in use, among others *leptothrix buccalis*, *vibrio buccalis* (*spirillum sputigenum*) and *spirochæte denticola*, and further a thick spirillum and a leptothrix which occurs in short, stiff, pointed threads. These are found in every mouth, and notwithstanding the fact that thousands of attempts have been made to cultivate them, no one has ever yet succeeded. We must, therefore, constantly bear in mind in the study of infectious diseases of the mouth (we might say in the study of all infectious diseases), that possibly the specific bacterium in the case under consideration is one which cannot be cultivated with the means now at our disposal.

* Von Kaczorowski, Deutsche Med. Wochens., 1885, page 570.

CONTRIBUTIONS TO THE HISTORY OF DEVELOPMENT
OF THE TEETH.

BY CARL HEITZMANN, M. D., AND C. F. W. BÖDECKER, D. D., S., M. D., &c.

CONTINUED FROM PAGE 230.

John Gibson (*Der Zahnarzt*, 1846, Vol. I, p. 89) gives a short description of the development of the teeth, which he concludes with the following :

I. "The human teeth are developed from the mucous membrane;

II. "The permanent teeth are in no connection with the temporary teeth, and are not products of them;

III. "The tooth germs must be regarded as onion-like formations." (*Zwiebelbildungen*.)

Joseph Linderer (*Der Zahnarzt*, 1847, Vol. II, p. 193) is of opinion that in the development of teeth a peculiar fluid is secreted in the tooth sacs, which, by coagulation, forms small round cells, out of which all other cells, canals and fibers are developed. The author observed great similarity in the structure of the dentine to that of the enamel. He describes the enamel as composed of "Enamel fibers, which consist of the peripheral fiber and a juice fiber (*Saftfaser*), 2 juice cells (*Saftzellen*), 3 cross fibers, tuft fibers (*Buschel-fasern*), and canals, 5 ground cells." The author also describes the lamellated appearance of the enamel, of which he mentions two kinds, the temporary, which disappears in fully formed enamel, and the permanent lamellation. The latter he locates in places at which the bundles of enamel prisms assume another direction, and are produced during the development of the enamel. On the formation of the dentine he states that the dentinal fibers are formed by the lengthening of the nucleus (*Central Zelle*) of the ground cell, while the basis-substance and canals are produced by the other parts of the cell. He at last declares that the cementum is formed by the dentine after the tooth has pierced the gum.

A. Krukenberg (*Der Zahnarzt*, 1850, Vol. V, p. 112) describes

the communicating branches of the dentinal fibers, especially those in the root, while in the crown of the tooth he believes that no such communications exist, except near the enamel, where the dentinal fibers anastomose with one another by their bifurcation. He believes the dentine identical with bone in the manner of its nutrition, as he states that both the canaliculi of the dentine, and the lacunæ and their canaliculi in bone, contain a plasmatic fluid, a view which at that time was generally accepted in regard to bone tissue.

A. F. Talma (*Der Zahnarzt*, 1853, Vol. VII, p. 193) comes to the conclusion that the teeth, like all other parts of the animal body, must be alive.

J. E. Oudet (*Der Zahnarzt*, 1853, Vol. VIII, p. 257, and Vol. X, p. 65) is of opinion that teeth belong to the tegumentary formations, and have no identity with bone tissue. He also assumes that the permanent molars are derived directly from the oral mucous membrane.

Moritz Franco (*Der Zahnarzt*, 1856, Vol. XI, p. 1) noticed the first traces of the teeth in human embryos about the third month, but is of opinion that the teeth are not derived from the oral mucous membrane, but from the periosteum of the bone, which forms the tooth sacs, and in which the enamel organ is developed.

Natalis Guillot (*Der Zahnarzt*, 1858, Vol. XIII, p. 177) holds the view that the tooth germs grow from the bony portion of the jaw until they reach the mucous membrane. The germ splits up into the three different parts, out of which the three substances, enamel, dentine and cementum, are developed.

E. Mühlreiter (*Deutsche Vierteljahrsschrift für Zahnheilkunde*, 1868, p. 168), in an article on the arrangements of the Odontoblasts, after a careful consideration of the literature on the subject, states the results of his investigations, from which he derived the conclusion that there are two different layers of odontoblasts, one situated externally, and which, when a pulp is removed from an adult tooth, adheres firmly to the dentine. Below this layer he describes another stratum of cells which are in communication with the tissue of the pulp, to which they adhere. He was, however, unable to explain how these two layers of cells were united to each other. Regarding the formation of the basis-substance, this author is of opinion that it is formed by excretion, in which process the dentine

cells are passive, but the blood-vessels of the pulp are actively engaged.

George Rolleston, in a short article read before the Odontological Society of Great Britain (*Quarterly Journal of Mic. Sci.* 1872, p. 109), on the Development of the Teeth of Mammals, observed that after the stellate reticulum of the enamel organ had mostly disappeared, the blood-vessels of the capsule (tooth sac) ramify closely around the enamel-forming cells.

Hohl (*Deutsche Vierteljahrsschrift für Zahnheilkunde*, 1869, p. 114) observed in two temporary teeth, which he extracted from the mouth of a boy seven years of age, who was suffering from hydrocephalus congenitus, that the cementum upon the roots of these teeth was very irregularly distributed. He also noticed many Haversian canals, both in the cementum and dentine, some of which were in direct communication on one side with the vessels of the pericementum, and on the other with those of the pulp. He found a great number of interglobular spaces in the dentine.

Heinrich Frey (*Grundzüge der Histologie*, Leipzig, 1875, p. 78) gives a short description of the development of the teeth, and only states that the dentine is formed by the odontoblasts, the enamel by the epithelial cells (ameloblasts), and the cement by the tooth-sac, but he does not mention anything of the manner in which these tissues are developed.

Joseph Hyrtl (*Lehrbuch der Anatomie*, Wien, 1885, p. 424) is of opinion that a primary furrow runs along the jaws, covered by epithelium, which is gradually deepened, and which, by the upward growth of tooth-sac, divides this continuous furrow into single enamel germs, one for each tooth. In regard to the formation of the enamel and dentine, he states that the enamel cells become the enamel-prisms, and the odontoblasts form the dentinal fibers around which the basis-substance is deposited.

E. Klein (*Atlas of Histology*, Philadelphia, 1880, p. 184) maintains that the basis-substance of the dentine is formed by the odontoblasts, while the dentinal fibers are derived from a deeper layer of the tissue wedged in between the odontoblasts, and states that the assertions of Boll may be correct, viz.: "That the non-medullated nerve fibers ascend into the dentinal canals." He further says that owing to the upward growth of the tooth-sac, the

epithelial cord of the enamel organ loses its connection with the latter. He then describes the formation of the stellate reticulum from the epithelial elements in which he observed no blood-vessels. This change the author declares to be due to an accumulation of fluid between the epithelial elements, and is opposed to pronouncing it connective tissue.

Klein further states that as development proceeds and the middle membrane of the enamel organ disappears, the inner and outer membranes (epithelium) are again brought in contact, and he believes the enamel to be formed in the same manner as the dentine. He describes the transverse striæ of Retzius to be the points of union between the different enamel cells. The cuticle of the enamel (Nasmyth) this author believes to arise from the external epithelium, and the cementum to be formed from the tooth sac.

T. L. Buckingham, in a paper read before The New York Odontological Society, April 20, 1880, says: "I take exception to the theory of these two histologists (Sir J. and C. S. Tomes), that the dentinal pulp is the formative organ, and that the dentine is formed from the cells of the outer layer of the pulp. That the dentine is formed between the pulp and what is called the preformative membrane all admit, but that either of these produces it, I doubt very much. My theory is, in regard to the origin of the dentine, that either a peculiar cell is created or one is metamorphosed into a dental cell, and it multiplies in some one of the ways that cells multiply in other tissues. * * * The new cell being at first all germinal matter, soon begins to harden on the outer surface, and the most of it becomes formed material, but there always remains a portion of the germinal matter which is pushed towards the pulp and continues to grow in this direction, leaving behind it the hardened portion and a small fiber of germinal matter. With this theory a single cell would form the whole length of the dentinal tube. * * * As the space at the periphery of the dentine is greater than near the pulp, * * * crowding together takes place to a certain extent, two cells coalesce, and in this manner branches are formed.

Robert Mathes (*Deutsche Vierteljahrsschrift für Zahnheilkunde*, 1881, p. 252) gives a quotation from an article by Heinrich Schmidt: On rhachitic deformities of the jaws and their influence upon the teeth, in which the author (Schmidt) describes the mal-

formations of the jaws, and also states that probably the transverse furrows upon some incisor teeth of rachitic patients may be referred to an abnormal development of the tooth germ.

Myron D. Jewell (*Dental Cosmos*, Vol. XXVIII, p. 457) states that after the disappearance of the matrix (*stellate reticulum*) the external epithelium and the internal epithelium of the enamel organ become united into one layer of tissue, and as the stellate reticulum is not a secreting organ, it cannot furnish the lime-salts deposited in the enamel. He is, therefore, of opinion that lime-salts must be furnished through the circulation, and that the process of calcification is deferred until the outer and inner epithelium have been united into one layer, as in the former layer there are present quantities of blood-vessels. This author states that the enamel is formed at the extremities of the ameloblasts, but does not say in what way. Of the formation of dentine, he asserts that the odontoblasts recede in advance of the accumulating dentine, which odontoblasts probably are continued into the dentinal canal(s).

(TO BE CONTINUED.)

AN ADDRESS ON CONGENITAL DEFORMITIES OF THE MOUTH AND FACE.

BY ROSWELL PARK, A. M., M. D.

PROFESSOR OF SURGERY IN THE MEDICAL DEPARTMENT OF THE UNIVERSITY OF BUFFALO.

DELIVERED OCT. 25, 1887, BEFORE THE SEVENTH AND EIGHTH DISTRICT DENTAL SOCIETIES OF THE STATE OF NEW YORK, AND SPECIALLY REPORTED FOR THE INDEPENDENT PRACTITIONER.

Mr. President and Gentlemen:—

I fully appreciate the honor that your committee conferred upon me when they invited me to address you to-night. In waiting about for a subject, it occurred to me that the time could not be more profitably spent than in a consideration of Congenital Deformities of the Mouth and Face. Some of these are common, others you may never see. If you are not already familiar with the method of operating

on those that you do see, it is well that you should know how they may be treated; and of those that you seldom or never see, there are many that are very peculiar and interesting.

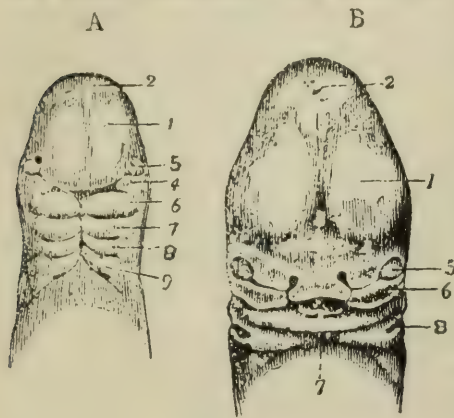


FIG. 1.

Head of Human Embryos; A, at end of third week; B, at end of fifth.

A 4, and B 6, Superior Max. processes.

A 6, and B 7. Inferior do., the latter now united in the middle line.

3. Naso-frontal process.

X. The tongue.

8. The first pharyngeal cleft.

(From Ecker.)

sary to the formation of the upper jaw. The second projections are the so-called inferior maxillary processes, which also meet in the middle line and form the lower jaw. This, the second post-oral process, is interesting to us, for from this is developed the upper part of the hyoid bone.

Let us turn to the same ovum three weeks later, at the end of the sixth week. (Fig. 1 B.) All the anterior parts of the skull, that is, the portion in conjunction with the brain, the eyes and their sacs, are developed more, and the naso-frontal process now has quite an identity of its own. The superior maxillary process has extended further toward the middle line from its rudimentary position, as shown in the first diagram. On the side is the so-called lateral mass, that comes down from the frontal and ethmoid bones and unites with the naso-frontal process to form the nose, and with the superior maxillary process to help form the upper jaw and the lateral walls of the nose. In the middle is the rudimentary tongue, which has a size disproportionate to the rest of the upper part of the embryo. The completed lower jaw, sometimes called the mandibular arch, is now plainly seen (B 7).

What I am about to say to you on this subject has so much to do with the embryology and early formation of these parts, that I propose for a moment to review the formation of the face. (See fig. 1, A and B.) I want to call your attention to the downward projection, which is the so-called naso-frontal process, and to these comparatively smaller points (A 4 and B 6), which are the superior maxillary processes from which are developed, a little later, the superior maxillæ. These grow from their present lateral position and unite with the naso-frontal process, which is neces-

At the third week it has advanced pretty close to the middle line, but has not yet united across that line, while at the sixth week it has united. If you bear in mind these facts, it will very clearly explain those more common defects, such as hare-lip and cleft-palate, and will also account for these exceedingly rare and excessively horrible deformities which are sometimes seen across the whole face. Fortunately, infants having such deformities usually die soon after birth; sometimes, however, they grow up.

CLEFTS.

The most common clefts are cleft-palate and hare-lip. We cannot well understand the formation of cleft-palate without bearing in mind the development of the part. Fig. 2 is a representation of double cleft-palate, and the mass which projects is the lower aspect of the septum of the nose, carrying with it also the so-called intermaxillary bone. This bone is developed in some of the lower animals, and in some of them never completely unites—that is, it never fuses with the adjoining superior maxillary bone. A line of suture always exists between these bones, such as is found between the various bones of the cranium, but in the human being this suture can be found only before the twenty-fifth week, after which it disappears. But occasionally this line of union between the intermaxillary bone—or, as it is called by some, the incisive bone—and the superior maxillary does not take place, and then we have a fissure which may be either unilateral or bilateral, and in that case we have a single or double cleft-palate. This intermaxillary bone is a result of the fusion of the naso-frontal and the superior maxillary processes. The main part of it is developed downward from the naso-frontal process, and when it fails to unite with the superior maxillary process, we have the cleft.



FIG. 2.
Fœtal Skull, showing the Intermaxillary Bone
with Double Clefts.
(Carroll's.)

Of these forms of cleft-palate there may be several varieties:—

(1.) The double cleft, which extends backward on each side of the middle line.

(2.) A common cleft running through the hard and the soft palate, in which case the uvula is generally thrown to one side and may not be recognizable.

- (3.) A single lateral cleft, extending entirely through.
- (4.) A cleft which does not involve the alveolar process or gum.
- (5.) One in which the cleft extends only part way through the hard palate, coming up within say three-quarters of an inch of the alveolar border.

(6.) A small cleft of the uvula alone. This is the mildest of all, and is remedied by the simplest possible surgical procedure.

The conditions of which I propose to speak to you to-night are amenable to surgery only, and cannot be cured in any other way, though you may palliate them with apparatus which you well know how to devise. When the intermaxillary bone projects very far forward, as in fig. 3, it makes a doubly disgusting deformity. Here is a projection, apparently from the nose; that is, the growth is attached to the septum, and is almost on a level with the tip of the nose. It is hard enough to close the fissure at best, but when the case is complicated with this unwelcome mass, one hardly knows what to do. There are three ways of getting at such a projection as this; one is to force it back and try to maintain it there by sutures. In mild cases this may be done. The second way is something like this. Virtually, we have the septum of the nose carrying the intermaxillary bones forward; with cutting forceps a V-shaped piece is taken completely out, then seizing this mass firmly, it may be crowded back to its place and so held that it will adhere for life, if there be sufficient vascular supply; otherwise it will gangrene and drop off. The next thing to do, the last resort, is entirely to excise it and bring the parts together without reference to it.

These cases of cleft palate are too often complicated with hare-lip, and the question arises—What shall be done for the child; when shall we operate, and how much shall we do? Let me say this to you; when a case is complicated with hare-lip, attend to that first. It is astonishing how much can be done by gentle prolonged pressure. If you do nothing else than unite that labial fissure, you will then get the pressure of the lips. For one moment or one hour, that amounts to very little, but when it is kept up for month after month and year after year, it does a great deal; not in bringing the sides of the jaw together, so much as in preventing the face bones from separating as they grow to adult size, so that it is always worth while to operate on hare-lip early. How early? I have operated within two or three weeks of birth, and I know one surgeon

who claims to have operated on a child on the sixth day from birth. There is not quite such hurry as that, but I would advise you to operate within two or three months, unless the child is sickly and not likely to live. If it is in the hottest weather and there bids fair to be marasmic trouble, and the child is already delicate, you may say that it will not pay to torture the infant, which will die at all events.

One needs so much room for staphylorrhaphy that it is usual to wait till the child is five or six years old, operating immediately on the hare-lip, and feeling quite sure that the fissure will not widen any if it does not actually approximate. Quite recently, however, the Germans are advocating early operation for cleft-palate.

You may have simple hare-lip, uncomplicated by any fissure in the palate or alveolar border at all. Practically, if the cleft exists, it is almost al-



FIG. 1.
Hare Lip. Fissure of Lower Lip.

(From Jones.)

ways on one side or the other of the median line; it is very rare in the middle line. You may have single or double hare-lip. Garretson's *Oral Surgery*, which I suppose you all have, gives full descriptions of methods, and it is unnecessary for me to recapitulate them. I do not, however, always use hare-lip pins, and, for that matter, my method of operating differs a little from the classical method, but not so much so as to make it important to say anything about it. It is always advisable in operating on hare-lip to pare your fissures and get fresh edges, but not to *rust* away any integument until you find that you cannot utilize it. When the two edges are brought together, you will, perhaps, find that you greatly need the little part of skin, and if it had been not com-

pletely off it would have been a mistake, for it can often be used to complete the continuity of the upper lip.

The question is sometimes raised as to the benefit of operations on cleft-palate with respect to articulation and deglutition. Many a patient is willing to go through life with a cleft-palate, because it does not show unless he or she opens the mouth, provided they cannot be assured that the speech is to be improved. You all know the excessively disagreeable nasal twang which this fissure causes, and it is a very important thing to know whether we can promise a person that he can speak better. Such patients will put up with the disgusting dropping of mucus into the mouth, and the discomfort of food passing up into the nose, if they cannot be assured that their articulation will be bettered by an operation. A child six years of age will not have learned to talk very much by that time, and if you operate on it early, the probability is that you will effect a great improvement by the time it is ten or twelve; but if the patient waits till he is twenty or thirty, and then undergoes an operation with the hope of improving his speech, both patient and operator will probably be disappointed; so it is always enough for me to operate in such cases for the sake of correcting the disgusting dropping of mucus and the inconvenience of deglutition, and not on account of the improvement of speech.

ATRESIÆ.

Such a thing as absolute closure of the nostrils has been met with, but it is rare. One or two cases are on record in which the nose has been occluded by bony union, so that it has been necessary to go through the obstruction with a bone drill. Membranous atresia is not so rare, though still uncommon. Sometimes the membrane is thick and tough, sometimes the merest film. Another deformity is that the nostrils are congenitally small. One sees complete closure of the nostrils, anteriorly, as the result of disease, as from cicatricial contraction, the result of syphilitic ulceration, and I have seen similar cases from diphtheritic lesions, but such cases are quite uncommon, and this congenital narrowing is still rarer.

Three cases of congenital narrowing of the posterior nares have been reported in Ziemssen's *Cyclopedia*. Closure of the posterior nares by diphtheritic or syphilitic processes is by no means uncommon. I have a woman at the hospital to-day, under my care, whose

pharynx is almost shut off from the mouth by superficial ulceration, which has drawn down the palate so that there is almost no communication between the mouth and the pharynx proper. I have seen a similar case in a boy suffering with hereditary syphilis.

FISSURES AND DEFICIENCIES OF THE NOSE AND MOUTH.

Complete absence of the nose has been noticed in an infant at birth, and once in a while these patients have grown up and the absence of the nose has had to be atoned for by some mechanism, or by a plastic operation. When the nose is entirely absent, it is better to make some artificial contrivance rather than to perform the plastic operation.

Operations for fissures on one side of the nose and mouth have been made. (See fig. 4.) I am aware that these pictures are not lovely to look at, but they are after nature, and instructive, I hope.

So, too, lateral failure has been noted on one side of the face. Fig. 5 is a fissure extending from the mouth laterally, and it corresponds to a failure of closure between the superior and the inferior maxillary arches and the soft parts which cover them. It is very easy to explain if you refer back to the embryological development of these parts, but unless you do, it is a miracle.

The worst case of which I have any knowledge was that of a child which fortunately died when it was three days old. (See fig. 6.) This case presents a variety of fissures. There is almost complete absence of the palate. The tongue is rudimentary, and strange to say there is a bridge extending from the ordinary skin of the cheek up toward the superior maxillary bone, which there is no explaining, so we must call it an accident. But the whole thing, disgusting and unpleasant as it is, may be explained, with the exception mentioned, by reference to the embryology of the face and head. There are such things as double lateral fissures, occurring on both sides. The natural result of such deformity is to extend the mouth and make it spread, literally, across the face. That is one form of the deformity known as *macro-stoma*, which



FIG. 4.
Lateral Fissure of the Nose.
L. C. C. C. C.

simply means large mouth. On the other hand we have the condition known as micro-stoma, which is a congenitally small mouth.

Median fissures of the face, affecting the upper jaw, are comparatively common; those of the lower jaw are uncommon; only three cases of median fissure of the lower jaw, tongue and hyoid bone, have been met with. Such defects in milder form are known, as, for example, when there is a false joint in the middle of the

lower jaw, or no union at all, or splitting of the tongue, which, as you know, is the natural condition for serpents and some other reptiles. There are one or two cases on record in which the tongue has been divided into three parts instead of into halves.

Taking up for a moment atresia of these parts, there are cases on record of complete fixation of the tongue to the floor of the mouth. Much more frequent are partial illustrations of the same in tongue-tie, in which the frænum is too short. Simple splitting of that is enough. Don't be frightened by the statement made in some books that there is an artery in the frænum, and that the patient may bleed to death. Such a thing might occur, but there is very little danger of it. But there

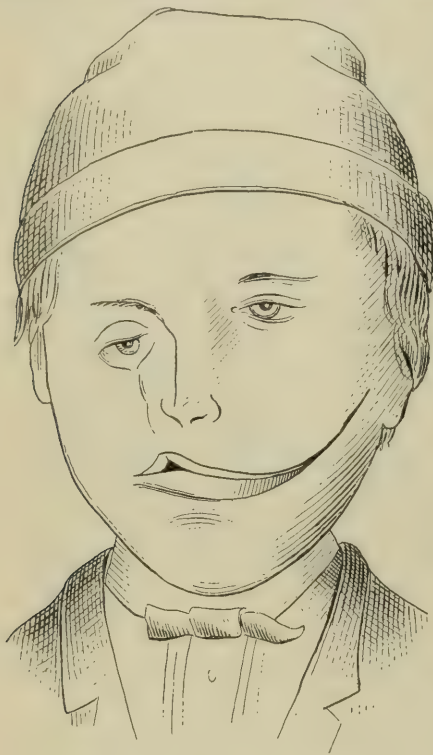


FIG. 5.

Oblique Fissure of the Face.

(From Pelvet.)

is danger of doing too much in this operation, for in some patients, who have already a long tongue, there might occur what is called "swallowing the tongue." One might imagine this an impossibility, but the tongue may be so long that it will get down into the throat and choke the patient. Cases of persons who could really swallow their own tongues have been exhibited. There are also instances of extreme elasticity and flexibility of the tongue, with unusual length. There was one man who could stand perfectly erect and put the tip of his tongue down to his chest, although it did not, in the mouth, appear abnormally long. That is, in one sense

of course, a deformity. In another case the jaws had grown together simply by an adhesion of the gums, and not by a bony ankylosis.

Another case of extreme embryological interest, which is, so far as I know, unexplained and very rare, is that represented in *fig. 3*. This cut I used a moment ago to illustrate the projection of the intermaxillary bones, as it does, but here are two marks representing



Fig. 3.

Head of a three-day-old child. Specimen in the Great Exhibition, from Warsaw.

- a. Constricted corners of mouth.
 - b. Enlarged nasal cavities.
 - c. Intermaxillary bone.
 - d. Alveolar process.
 - e. A bridge of integument from the angle of the mouth to the gum.
- Described by Romberg. (from *Zeitschrift*.)

fistula of the lower lip. There is nothing corresponding to it in the lower animals, or in the embryo, and this is an exception to a law which is something like this—that no matter what the deformity in the human species, you will find its analogue, either in the embryological life of the human foetus, or in the lower animals. But I know of no analogue of this. Sometimes the fistula leads down from one and a half to two centimeters, and is simply a blind

opening. Sometimes there are two fistulæ which converge, and sometimes they diverge. They seem to have no function whatever, and lead nowhere. Such a condition is easily remedied; it is the embryological interest it has which makes me allude to it.

CONGENITAL DEFICIENCY IN THE SIZE OF THE LOWER JAW.

There are cases on record in which the lower jaw does not match the upper jaw at all. These are usually accompaniments of fissures of the cheek and lips and other abnormalities. Langenbeck reported a case in which he could pass his hand into the child's mouth and feel that the ascending ramus was entirely absent, and then he could pass his finger up in the proper direction and feel the glenoid cavity of the temporal bone, and assure himself that it was empty. These deficient lower jaws usually have too few teeth.

Complete absence of the tongue is sometimes noticed. The most remarkable case on record is that reported by a French surgeon, some time ago. The tongue is sometimes found to be too small, and this results from a failure of the original tubercle, which represented the tongue, to develop properly. Then there is the so-called micro-glossus, which is simply the Greek word for small tongue, and, on the other hand, you and I will occasionally see a child whose tongue is too large for its mouth. Some of these patients cannot bring the teeth together without great effort, and these cases are always accompanied by tooth-marks on the sides of the tongue. That may be a congenital deformity, or it may arise in connection with the kind of tumor which we call lymphangioma. You might call it elephantiasis of the tongue, for it is to the tongue what elephantiasis is to the skin of the limbs. The forms of macro-glossus are amenable to treatment, but micro-glossus is not. It is not possible to expand the tongue, though you may make it smaller by cutting out a piece, or by causing it to contract by the application of the cautery.

There is another disease known as macro-cheilia, which means large lip. One occasionally sees an immense overhanging upper lip, or an underhanging lower lip. This may be a congenital trouble, or it may be acquired. The case represented in fig. 7 is one of macro-cheilia, due to a venous tumor in the lip. It is a condition similar to macro-glossus—a kind of elephantiasis of the lip. Of course, as much of that as may be necessary may be cut away. One sees these venous tumors of the lip, beginning as a "mother's

mark " or "strawberry mark," so-called, and if attended to early, they may be perfectly cured, but if put off, they may grow very large.

This same form of venous tumor may occur in the inside of the mouth. I have recently had under treatment and, I think, cured, a lady who had something of this kind in the inside of the mouth, spreading on the ramus of the jaw and down to the fauces. The remedy in her case was electrolysis. I also cured a young man in this city, of a corresponding condition, only worse, where the lower lip, upper lip and cheek were covered with such a tumor. I employed in this case a mixture of electrolysis and ligation.

Of the other tumors which are congenital in origin, let me refer to the papilloma, or warty growth. I have recently removed part of the tongue from a child which, when born, had a tumor on the front of his tongue: when presented to me the tongue was protruding from the mouth like a fist. It could not eat, could not drink, and could hardly nurse. I have also seen a child, the interior of whose mouth was covered with at least two hundred of these small papillomata.

Then the form of cystic tumor which comes underneath the tongue, known as ranula, may, sometimes, be of congenital origin, though this is in many cases an illustration of the formation of a cyst by occlusion. There is one form in which the duct is perfectly patulous, but which consists of a dilatation of the gland structure proper. The best treatment is complete excision of the cyst.

The so-called dermoid tumors are growths of no small interest. They are cysts containing more or less fluid, but they contain also such things as teeth and hair, and irregularly developed fragments of bone, and even other parts which grow from the external layer of the blastoderm, and they may be found in the mouth as well as anywhere else. A very interesting case of cystic tumor was reported in the *INDEPENDENT PRACTITIONER* a few months ago.

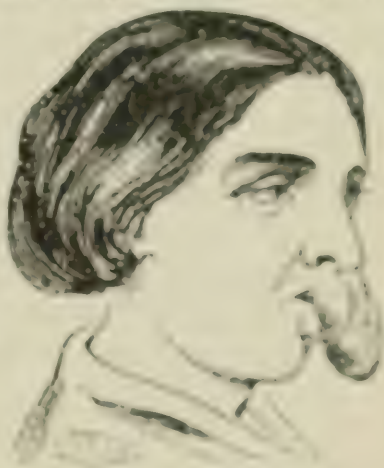


FIG. 1.
Venous Angioma.

(Cambridge.)

and that is the best illustration I have seen. (See Vol. VIII, page 295.)

There are dentigerous cysts connected with abnormally developed, or, usually, misplaced teeth. You will find a tumor projecting into the mouth or against the cheek, which is hard, yet which seems to fluctuate; the cyst is opened into and you find a little fluid and a tooth. It may be that the tooth started too far down and could not grow up into the light; or it may be that the tooth started in the right position, but grew down or laterally instead of upward, or it may be that the root was not properly developed, and so the tooth was not pushed out into its proper place.

Lastly, I desire to speak of a class of tumors which may be found about the jaw, as well as anywhere else, which offer to pathologists the highest degree of interest, which are rare, and yet, as curiosities, ought to be mentioned to you to-night. They are the *Teratomata*. These tumors are connected with monstrosities. I desire to draw a distinction between dermoid cysts and *teratomata*. In the dermoid cysts you simply find such structures as are developed from the external layer of the blastoderm; in the *teratomata* you find parts which must have developed from two, or all three of the blastodermic layers. In the dermoid cyst you may find a calcified plate, which may easily have come from calcification of a piece of skin. In the *teratomata*, however, if you find a complete jaw or half a complete jaw, or other parts of a *foetus*, it is a different matter. A case was reported some time since of a child who presented a large tumor on the face. On its removal and dissection there were found more or less complete parts of, apparently, a twin child. That did not mean twin pregnancy—it was an example of these rare growths, the *teratomata*.

Meyer reported, not long ago, a case in which a tumor was found growing on the lower jaw and on the side of the neck, and on its removal a complete lower jaw was found within it. You cannot have a complete lower jaw in a dermoid cyst; it was, therefore, a *teratomata*.

I have hurried over these points as briefly as I could to-night, and while there is much else that I should like to say to you concerning these matters, I will simply confine myself to one further abnormality, which does not exactly concern the mouth, but which comes up in connection with what has already been said. I refer to the

bronchial cysts. You see between each of these arches (see fig. 1) a dark line representing a cleft. The arches start separately from each other, and later are drawn together, while the interval between them should be entirely closed. These fissures, by the way, are called bronchial clefts or fissures, because they correspond to the bronchiae or gills of fishes, being to the human foetus what the gills are to fishes. When they fail to close in the proper manner, they almost always give rise to cystic tumors. Such tumors extend, and, to a certain extent, migrate. Thus it may happen that one may be found extending from near the ear almost to the shoulder. These cysts are rare, and it is only within the last few years that their pathology has been made out, but it has fallen to my lot to see at least two of these rare cases, and in each the tumor—having been shut off probably before the child was born, at any rate long before I saw either of them—extended down beneath the superficial fascia, from the ear to the chest. In one case, that of a young lady, it extended from the ear to below the mammary gland; from the middle line in front to the posterior axillary line behind, and fluctuated under the clavicle. The other case was that of a young boy in this city, from whom another surgeon had removed the part of the tumor above the clavicle, but had apparently been a little timid and had not removed the rest. When I saw the lad, two or three years after the operation, there was a fluctuating bag below the clavicle reaching far downwards in the axillary and pectoral regions. It took a great deal of careful dissection to remove this, but it was done and I have the specimen yet, as a complete unbroken sac.

I have, perhaps, presented some things which you may think do not primarily concern you, but I know that you, as members of the great medical profession, are anxious to know something of matters outside of your own legitimate field.

GAS FURNACES AND ENAMEL FILLINGS.

BY WILLIAM HERBERT ROLLINS.

I claim that what is valuable in the methods and apparatus which Dr. C. H. Land has patented and claims as original, is taken from the results of my investigations, made public property nearly ten years ago. Briefly stated these are:

1st. The discovery of the causes of gasing in firing pottery and porcelain.

2d. The introduction of a current of hot air into the muffle to prevent reduction of the colors, with its attendant results.

3d. The use of pieces of pottery, porcelain and enamel, moulded to accurately fit cavities in teeth.

4th. The invention of a practical baking furnace, using gas, or a mixture of gas and naphtha.

If, however, the members of the dental profession prefer to take licenses from the Land Company for the right to use methods and apparatus that were given them as long ago as 1880, I have no objection. So long as members of the dental profession who patent the results of their researches and work then for their own profit are honored to the highest extent in our power, by being asked to lecture before our schools and before our societies, so long will dentistry remain a trade, and I for one shall be ashamed ever to use my dental degree. Well did Merriam say in memorable words: "What would be thought of Dr. Bigelow, and how would his name go down to history if he had asked or received from his brothers a royalty for each time they performed his operation for stone, or sold his instruments so that they could be withdrawn from competing with those in the market, or patented and received a revenue from them?"

As this is the last time that I shall allude to the origin of gas baking furnaces and crockery fillings, I shall give the data at some length. Prior to 1879, I had devoted much time to firing ceramic compounds by gas and naphtha. In the year named I had found out the causes of failure, and had perfected a practical furnace, which has been in constant use from that time until within a year. In 1879 or '80, I read a paper on this subject before "The Society for the Advancement of Oral Science." I exhibited methods of moulding enamel, porcelain and pottery, to accurately fit cavities in teeth, described my furnaces, showed the cause of gasing, explained that this could always be avoided by using an excess of hot air in the muffle, and exhibited my instruments and apparatus. By vote of the society this paper was sent to the *Boston Medical and Surgical Journal*. It was returned by Dr. Hamilton Osgood, who

said it was "too technical" for his journal. I then made one more attempt to make the investigations more widely known than they had been by the reading of my paper. I sent the paper to *The London Lancet*. If any one is curious on this subject, I would refer him to that journal for 1880, where he will find that the paper was accepted for publication "in an early number."

In this connection, this abstract from *The Lancet* for March 31, 1885, may be of interest. "Gas Furnaces for Dental Purposes. In reference to criticism by Mr. Fletcher of a paper (by Dr. Rollins) in *The Boston Medical and Surgical Journal*, it is but fair to the latter gentleman to say that, early in 1880, we received from him a paper which not only contained a full account of a gas furnace for baking dental porcelains and artificial teeth, but was also accompanied by a wood cut taken from a photograph of the furnace."

I waited a long time in vain for my paper to appear. Afterward, when I was connected with the *Boston Medical and Surgical Journal*, I made abstracts of this paper, which were published from time to time. "Enamel Fillings" was printed April 26th, 1883. "Gas Furnaces and Causes of Gasing in Firing Pottery and Porcelain" October 23, 1884, and at other times these investigations have been alluded to. These articles were copied into other journals, but I cannot tell which ones, as it is impossible for any one who takes as many journals as I do to preserve them; they would fill his house in a few years. I remember that the two mentioned were reprinted in *Items of Interest*. I am sure of this for two reasons. First, because I was surprised that Editor Welch should have published these as original communications, when, at his request, the editor of the *Boston Medical and Surgical Journal* had loaned him the electrotypes which were used to illustrate the articles. I thought it an unfair return for the courtesy shown to him, and it made a deep impression on my mind. Second, because these articles having met the eye of Thos. Fletcher, he wrote to *Items of Interest* a very unjust criticism of them, saying, among other untrue things, that I must be singularly ignorant to suppose there were any advantages in using hot air in a baking furnace, an arrangement only intended to save fuel in large iron furnaces. He said several other disagreeable things, but I quote this one to show that even the manufacturer did not understand the object of heating the air blast in baking pottery and porcelain, one of these objects being to pre-

vent cooling the muffle by introducing cold air in the proportion required to prevent gasing from the imperfect combustion, which is likely to result if the amount of air is not large enough to more than unite with the gas. As I clearly stated that a slight excess of air should be used, it seems as if one of my reasons for using a hot blast might have been apparent, even to Mr. Fletcher.

I do not claim to have been the first to produce heat enough by gas to bake teeth, but I do claim to have been the first who did so bake teeth, and I was able to do this by reason of my experiments on the causes of gasing in firing pottery and porcelain. I do not claim to have been the first to have filled teeth with crockery, but I do claim that I was the first to mould pieces of pottery, porcelain and enamel, to accurately fit cavities in teeth, and therefore was the originator of the modern method of enamel filling. When I began my investigations, I did not know that there was any furnace in which gas was used that teeth could be baked in, or that pieces of enamel or porcelain had ever been used to fill teeth. I have since learned that the latter method was used before I began to practice, but the grinding of a piece of artificial tooth, some time during one's professional career, to fit a simple hole in a tooth, is quite another thing from the modern method of enamel filling, and does not prevent me from rightly claiming to have originated this.

There is one other point in which Land claims originality, to which I should like to call attention. He claims to have discovered that carbon monoxide will pass through cast iron at baking heat. It seems an insult to the intelligence of the profession for a man to make such a statement as original. Dr. Derby's investigations, more than fifteen years ago, showed that this was true at a much lower heat. Any schoolboy could have told Land this, as it got into the text-books years ago and became a part of schoolboy literature.

There is one part of the Land Furnace which is original with him. This is the introducing of hot nitrogen into the muffle, through a separate pipe, to prevent gasing. A more foolish complication to a good baking furnace could not well have been devised. It is difficult to see why he adopted it, unless it was to have something different from my methods. What is the use of such a complication, when all that is needed is a slight excess of air, which can be carried in with the gas without any separate apparatus?

PLATINUM AND OTHER MOULDS FOR ENAMEL FILLINGS.

Platinum moulds were described by me eight years ago, and I should have nothing to say on this subject now, was it not that everything relating to these methods of mine is being made the subjects of patents by persons who care more for their own private gains than for the good of the profession. On this account, no details of procedure are too petty to put on record, for they may be of use to the profession in preventing the enforcement of unjust patents which may be granted in future.

The deposition of platinum on a non-metallic surface, as that of an impression, is not particularly easy for a beginner, as these simpler ways may be used. Make the copper mould described in previous papers,* and after cleaning the surface as is usual in galvanoplastic operations, stop off the back and deposit the platinum on the copper. When the deposit is thick enough the copper can be dissolved, when the platinum mould is ready for the introduction of the enamel, which can be baked in the mould as soon as dry. Made in this way, the filling is a little smaller than the cavity, but it answers well enough. If one is more particular, he can make a counter mould, and then deposit the platinum on this. Another way is to line the cavity in the tooth with some readily soluble metal, which at the same time is soft. This can easily be done with thin sheet copper, which is laid over the cavity and made to fit it perfectly by means of a wad of cotton and hand pluggers. Then fill up the hole in the copper with modeling, or other suitable composition, and when this is set remove the copper from the tooth. Or, instead of taking the impression directly from the tooth, a copper mould can first be made as before described, and then the impression in this metal made from this. In either case, the platinum is to be deposited on the back of this made impression, which, when the platinum is thick enough, is to be dissolved in acid, leaving the platinum mould.

* Impression Compound. Take of rosin 100 parts, paraffin 50 parts, thick lard 10 parts. Melt and mix together and pour into cylindrical one square of tin held in diameter and one half thick.

For use, prepare the cavity without undercuts and surround it with a narrow quantity of paraffin to prevent adhesion of the modeling compound. Before using the narrow part of one of the sticks and press it firmly into the cavity. The rest part of the stick will act as a plunger, pushing a most perfect impression. Moisten each impression of each cavity. Then wrap a few copper wire around each impression, dip them for a moment into cold water and then back into the precipitated slush, brush until there is a grey coating and then deposit copper in the ordinary way, till the coating is thick enough, afterwards, when the impression compound is removed and the mould finished, it is ready for use.

Another way is to take the impression according to the method originally described; that is, with a stick of modeling composition, making from this a copper mould about an eighth of an inch in thickness, then from this a die and swaging a platinum plate to fit, thus producing a mould in platinum by swaging. Or make the die in copper, and the counter die in softer metal, thus producing, when the platinum is stamped, a counterpart of the cavity in the tooth, and of the same size inside.

In addition to these, there is the first method I employed, because the most obvious, that of using platinum fitted to the hole in the tooth by means of cotton and a blunt instrument, thus making at once a platinum mould for the baking of the enamel. This method is, however, less perfect than some others which I have given.

Another simple way is to take the impression as just described, deposit a thin layer of copper on it, just enough to make a coherent layer of metal, and then on this copper deposit the platinum till it is the right thickness; afterward, when the copper is dissolved off, we have a platinum mould which is a very little larger than the cavity in the tooth.

Platinum is not an easy metal to work by electricity without practice, so I give one method for this. Dissolve the metal in aqua regia, precipitate with ammonia water, wash the precipitate and dissolve in an aqueous solution of tartrate of soda. Use this solution in the same way that the sulphate of copper solution is used in depositing copper. Other organic acids will answer instead of tartaric, but I usually prefer the one named; nor is soda the only base which can be used.

Better moulds can be made by electricity than in any other way; in fact, the time will come when a small electric plant will become as much a part of a dental laboratory as a vulcanizer now is.

In past years I have shown that better dies can be made by electricity than by the methods in ordinary use. A copper die made by electricity is hard and of the same size as the impression, which it reproduces in the minutest details. That chemically pure amalgams can be more readily made by electricity than in any other way, I showed five years ago. I have also made all gold crowns by this method, without seam and fitting the root perfectly.

These are but a few of the things which we can make electricity do for us. Of some of these others I shall write in another paper.

Reports of Society Meetings.

ILLINOIS STATE DENTAL SOCIETY.

TWENTY-FOURTH ANNUAL MEETING.

REPORTED FOR THE INDEPENDENT PRACTITIONER BY C. N. JOHNSON, L. D. S.,
D. D. S.

The twenty-fourth annual meeting of the Illinois State Dental Society was held in the Opera House, Cairo, May 8-11, 1888. The attendance was probably not so large as on some previous occasions, but in point of interest the meeting was a most decided success. Seldom have there been presented better papers, or more animated discussions elicited, while the best of good-fellowship existed throughout. All possible arrangements were made for the convenience of the members, and to Dr. J. J. Jennelle, of Cairo, great credit was due for the accommodations enjoyed. The Illinois Society has an excellent record as a working, energetic body, and this year's meeting will certainly add to its reputation in this respect.

TUESDAY MORNING SESSION.

After the routine business of opening the meeting, the President, Dr. C. B. Rohland, of Alton, read his address.

He said it was the first time the society had held a meeting south of Jacksonville. He believed it was a timely move to come down into the southern end of the State, from the fact that dental societies are always followed by an increased interest in dental topics, not alone by dentists themselves, but by the general public. None but those who live in a community where ignorance concerning the teeth is prevalent, can appreciate the importance of employing every means of stimulating the public to a better understanding of their needs in this regard. They should be educated till they demand good dentistry, and then quackery will die for lack of support. This education should begin at home; that is, in each individual

practice. It is not enough to simply perform an operation; we should teach the patient how to prevent a recurrence of the trouble by proper care of the teeth. Besides this, we may deliver lectures on the subject in our public schools. If a practitioner has not the literary accomplishment for this, let him publish in the local papers reprints of articles relating to dental hygiene. The papers will usually be glad to do so. In the rising generation lies our hope. Short lessons on this subject should be printed in our primary school books. The writer hoped for practical results from the forthcoming report of the committee appointed by the American Dental Association to consider this question.

During the past year two important events relating to the profession have occurred. One was the recognition of dentistry by the American Medical Association, and the other the formation of the Dental Section in the Ninth International Medical Congress. Without wishing to harp on the old question as to the relation between dentistry and medicine, he hoped the day would come when the title of D. D. S. would be as much honored as that of A. M. or M. D. Even now, we practically subscribe to the same code of ethics in our societies. The Dental Section of the Congress was just successful enough to show what might have been done by concerted action on the part of the whole profession.

Referring to the action of the First District Dental Society of New York regarding the suits of the International Tooth Crown Company, he said it was a good movement, but that the expenses should not fall entirely upon a few gentlemen; they should be borne by the profession at large. The lessons of Josiah Bacon's time should not be forgotten.

Another question he would like to see brought up, was the agitation of the matter relating to the exemption of dentists from jury duty. They hold nearly the same relation to the public as medical men, and should be granted the same privileges.

AFTERNOON SESSION.

Dr. A. W. Harlan offered the following resolution, which was unanimously adopted :—

WHEREAS, The majority of the dental colleges in the United States do not require of their students a longer period of pupillage

than two years prior to the candidate's coming up for graduation, and—

WHEREAS, The Illinois State Dental Society believes that the time spent in college or in the study of dentistry is too short for proper preparation for entrance upon the practice of dentistry, therefore be it—

Resolved, That the National Association of Dental Faculties be requested at their forthcoming meeting in Louisville to adopt as a requirement for graduation that the student shall have studied three full years, including attendance on two full courses of college instruction in separate years.

The report of the Committee on Dental Science and Literature was then read by Dr. Louis Oitofy. The following is a summary: Are we scientific in what we do as well as in what we say? Is there harmony between our theories and our practice? Not altogether. We have not reached perfection, but we are slowly advancing. We are saving more teeth to-day than ever before. In this restoration the crowning of roots comes to our aid. Two years ago this committee pointed out the need of some better method of preparing roots for bands, to obtain perfect adaptation. The same need is present to-day. No one has given us a satisfactory method, though many articles have been written upon it, the most of which make the operation appear very simple. We cannot be sure that the upper edge of the band fits the root properly, even if there is good adaptation at the lower edge. Hints have been given that a tool was forthcoming which would render this operation easy and certain of accomplishment, but up to date none is within reach. Let some one strive to solve the problem.

In the *INDEPENDENT PRACTITIONER* for November, 1887, Dr. William H. Trueman published an essay on the "Dental Pulp," in which he advanced some new arguments. He says: "In cases where the cavity approaches the pulp-chamber, the possibility or probability of inserting the filling without exciting serious irritation in the organ it contains has not seemed to me the most important question. That, in most cases, with ordinary care, is readily accomplished. The real question has seemed to be this: Can we, by so doing, secure the best results?" He admits the value of a vital pulp, but argues that it should be sacrificed if, by its retention,

the permanency of the filling would be rendered doubtful, on account of imperfect preparation of the cavity through fear of encroaching too much upon the pulp, or from the bulk of the pulp-capping material when in place. He would not keep a pulp alive unless it were comfortable and well protected. His conclusions are summed up in the following, with which the writer agrees: "Much as I value a living pulp, I recognize that there are cases in which devitalization is necessary, preparatory to the insertion of a reliable preservative filling; that it is necessary in some cases where, could we avoid the mechanical difficulties encountered in securing the filling and satisfy the conditions deemed necessary to arrest decay, the salvation of the pulp would be reasonably assured. There are other cases where, from the condition of the pulp, its devitalization is merely a question of time, and practically the question is narrowed down to this: Shall we apply arsenic and devitalize in a few hours, or shall we attempt to preserve its vitality, with the almost positive assurance that the same result will be reached within two or three years?" This naturally leads to the question of immediate root-filling, which has been so much discussed of late. The truly scientific practice will likely be found in the middle ground between immediate filling and over-treatment.

Relating to histological subjects, the appearance of Dr. Black's articles on the periosteum and peridental membrane in book form is, perhaps, the most conspicuous work of the year. Dr. Stowell, in his "Microscopic Structure of a Human Tooth," has placed before the student a clear and concise representation of the dental tissues.

Regarding implantation, there is nothing new, except the report of Drs. Bödecker and Heitzmann before the First District Dental Society of New York. They examined a tooth that had been implanted six months, and found no "revivification of the dentine, cementum or pericementum." Implanted teeth are probably held in position mechanically. The writer reported eighteen cases in his own practice. Of these, three were unsuitable, leaving fifteen from which to judge. Twelve are firm, while three have failed, making a percentage of eighty per cent. successful cases. All except five have been implanted one year and over.

The germ theory of disease still claims the attention of the dentist. In this connection the question may be asked: What good is

coming to the profession through knowledge possessed in regard to micro-organisms? In answer, it may be stated that we have gained valuable ideas through agitation of this subject. We treat many cases much more intelligently than before, but we need farther light on this subject.

In the section of the report devoted to literature, special stress was laid on the importance of ceaseless study and active contribution to all our dental publications. Dentists are too shy about writing for journals. The lawyer and minister are almost of necessity men of letters, and there is no reason why the dentist should not have the same literary accomplishments. Jot down important items in practice, and finally write papers from them.

DISCUSSION.

Dr. T. W. Brophy—I would have been glad had the report told us how we could secure better adaptation of bands to roots. I have not seen proper instruments for this purpose. Roots are sometimes scooped out on the sides and so much contracted at the necks that, if made cylindrical, it would weaken the root. It might be better to have the band of some malleable material that could be burrashed down closely to the surface.

I do not indorse immediate root-filling. We can never know that incipient abscess is not present, and if it is, trouble will always follow such an operation. It is to be deplored that this practice is advocated to such an extent in our periodical literature, on account of the danger of leading young men astray. We should be more conservative in our practice. A root may be filled immediately if we have destroyed and removed the pulp ourselves; but even in those cases, I would prefer to leave it a day or two after removal, in order to destroy any living tissue that might remain in the canal. For this purpose I know of nothing better than carbolic acid, ninety-five per cent.

Dr. A. W. Harlan—The report was comprehensive for what it omitted. There was no reference to the recent publications of Drs. Talbot, Haskell, Essig, Mitchell and others. It is the duty of the committee to search for and point out to the society that which has been accomplished in the past year toward the progress of dental science and literature. It is no part of their business to discuss methods of practice.

Dr. E. Noyes—The criticism is just, but I think this report comes nearer to the point than any previous one. The report suggests the question as to how much the theories have done in a practical way for our success. I think they have done very much. For many years we have been doing empirically what we now do scientifically, and the advantage of the latter course is that we are more likely to treat a case intelligently, and obtain good results with more regularity, than when we were in the habit of putting creosote into an abscess simply because we felt it would cure it, without knowing why it did so. In the whole line of treatment where pus infection plays a part, we have found that the tissues respond more promptly to our methods, and we can forecast with greater certainty whether or not a painful condition can be averted, than before our recent theories were brought forward. I think all our methods have advanced in consequence of theoretical teaching.

Dr. Geo. H. Cushing—I am pleased with that portion of the report which urges practitioners to contribute more liberally to the periodical literature of the profession. I would strongly advocate the keeping of notes in daily practice. From these, papers can be prepared with facility.

Dr. A. W. Freeman—No practitioner can get along without four or five dental journals. In addition to this, he should read those books on dental topics which are most suited to his wants. I think the committee should point out the characteristics of the various books published from year to year, so that the members could select those which, individually, seemed most desirable for them to obtain, as it is too expensive for the average dentist to purchase all that are brought out.

Dr. Geo. D. Sitherwood—I take a number of dental journals, but so many reprints are made that I find little new material in them. I think more original matter should be published.*

Dr. G. V. Black—I would suggest that the gentlemen who criticise the journals for not publishing much original matter should write for the periodicals more extensively themselves.

Dr. J. W. Wassall—Dr. Freeman thinks it is too expensive to buy all the dental works published. I believe it is the best invest-

* The INDEPENDENT PRACTITIONER does not feel that it is amenable to criticism on this score. Not a line which appears in it can ever be found elsewhere, unless copied from it—always, of course, excepting items of news, which are common property.—EDITOR.

ment a dentist can make. When you buy tools you buy brains, and you can no more afford to do without them than you can afford to economize in instruments.

Dr. J. J. R. Patelsol—This defect of not having better original matter in our dental journals is more the fault of the dentists than the journals. When a periodical is published by a dental supply house, the latter feels under an obligation to its patrons, and will publish anything sent in by them. Another fault with societies is that they permit dental supply houses to publish their programmes and orders of business. They do not seem to recognize the fact that they pay for this in the end; it is a system of indirect taxation. The society ought to pay all its own expenses, and not rely on any supply house.

On motion the subject was passed.

The next order was the report of the Committee on Dental Arts and Inventions, by Dr. J. Frank Marriner.

Among new appliances and methods that have come to our notice during the past year, the following are mentioned. Cohen's Pincer. Dr. Newkirk's method of mounting steel polishing points. A new engine mallet, of small size, with stroke similar to electric mallet, with the advantage of instantaneous change by a thumb-screw; the blow can be made stronger than the Bonwill or electric mallet (E. E. Cady, *Dental Review*, Feb., 1888). Dr. W. G. A. Bonwill's method of packing amalgam by laying Japanese kishiko paper over small pieces of amalgam in the cavity, and pressing or burnishing them into position, repeating until the operation is complete; the committee believes that those who once try it will not abandon its use. A rubber-dam clamp, with double hooks on ears to prevent slipping down too far on the neck of the tooth, and spreading the gum (INDEPENDENT PRACTITIONER, 1887, page 1641. Improved labial or buccal clamps, by Dr. D. B. Freeman, Chicago; also by the same gentleman, new forms of matrices. A circular description of all Dr. Freeman's late inventions may be had on application, and the committee recommends an investigation. The Gould Dental Chair, by Charles A. Rippon, Warsaw, Ind., is also thought worthy of notice.

Two whole mornings—Wednesday and Thursday—were devoted to clinics and exhibition of new appliances. This will be considered further on in the report.

WEDNESDAY AFTERNOON.

Dr. John J. R. Patrick read a paper on "Dental Morphology and the Etiology of Irregularities." In the development of different parts of the body all morphological and physiological changes are identical with those which commenced the life history of the animal. All organized beings must develop from simple cells, which, in order to be productive, must meet and blend with dissimilar cells. The result of this blending is a true parent cell, which cells become a germ, the germ an embryo, the embryo a foetus, the foetus a child, and the child an adult. First, in the formative cell, we have a nucleus; then segmentation begins; then two cellular membranes are developed, the epiblast and hypoblast. Later on, a third membrane appears between these two, and is called the mesoblast. It is supposed to be derived from the hypoblast. These three membranes form the germ area or gastrodisk. The epiblast gives rise to all the epidermis, the epithelial lining of the cerebro-spinal canal, the ventricles of the brain, the cerebro-spinal nervous centers, and various parts of the organs of special sense. The hypoblast is the source of the epithelium in the alimentary canal, while the mesoblast gives rise to the remaining parts of the body, as the dermis, muscles, bones, connective tissue, blood vessels, kidneys, urinary apparatus, etc. Now it is difficult to understand how a tooth should be endowed with these three—the epiblast, hypoblast and mesoblast—when the latter alone contains all the organs of construction necessary for the production of teeth, bones, muscles, connective tissue, etc. Surely, a membrane with so much constructive ability could produce a tooth without aid. There is one thing certain, however; the fertilized cell is different from either the maternal or paternal cells, because it is in the real sense the male ancestor and female ancestor of all the numerous generations of cells which afterwards build up the many celled organism. This truth is verified by the fact that the child inherits many characteristics of both parents. We see the large teeth of one parent and small jaw of the other in the same child, and also the small teeth of one parent and large jaw of the other in another child.

In studying the development of the teeth, if we take a young

hog between eight and ten months old, we find the homologues of a child's first permanent molar fully developed. If we remove the lower jaw, zygoma and malar process, we expose a long, puffy ridge, running from the first permanent molar backward and upward, to what in time becomes the tuberosity. Remove the outer thin plate of the puffy ridge, and you will see the two cells of the last permanent molars in their sacular stage of development. Each sac enveloping the future tooth is connected with the gum by a funicle, which is merely an elongation of the sac. It is in the nature of an umbilicus, and the sac represents the placenta. This passes through the same developmental phenomena as does the mammalian embryo.

In the development of the sac, the funicle enlarges at the deep end, becomes detached from the gum, and contracts upon the newly formed enamel. At the same time, nutrient vessels from the surrounding alveola emerge and connect with the sac, thus establishing mutual intercourse of circulation. The enamel of the tooth being completed, the crown emerges from the alveolus, and the sac gradually dips back to the neck of the forming tooth. It there remains stationary, and the cementum, which some time previously began to form at the neck, continues to grow in the form of hollow cylinders, enclosing the granular protoplasm, which eventually is productive of dentine.

During all the developmental processes, the sac is the formative membrane of the enamel and cementum, so that in a morphological point of view the relations of the cementum and enamel show them to be homologous. Thus it appears that the line of succession in the formation of the hard tissues of the tooth is enamel, cementum and dentine.

Prof. Flower's diagrams of nerves depict the superior maxillary division of the fifth, with the posterior and anterior dental branches throwing off filaments direct to each particular tooth root. This diagram may be true regarding the main branches, but the branchlets of these branches, making direct connection with the roots, cannot be shown by dissection. I regard the diagram as being conventional anatomy in this respect. The teeth of the inferior maxilla are more directly connected with the inferior dental vessels and nerves, than are the teeth of the superior maxilla with the corresponding vessels and nerves of that region. This is due more to a

restriction of territory than to necessity, and it is this cause which prevents the development of supernumerary teeth in the lower jaw. They seldom appear in the inferior maxilla, because there is too little room in this region to permit of such extravagance. Superdentition is therefore much more common in the upper jaw.

Examples of supernumerary teeth are not always anomalous in form, and rarely make connection with the superior dental vessels and nerves. They usually obtain their supply from the surrounding tissue. They are sometimes found imbedded in the palate process, with the crown directed toward the alveole, and the question naturally arises; How can such teeth form direct connection with the superior dental nerves? Yet they have obtained from their surroundings nutriment sufficient to develop enamel, cementum and dentine.

The deciduous teeth are further evidence to establish the fact that the tooth germ can develop its several parts independent of special nerves and arteries, for these teeth are supplied by deciduous vessels, surrounded by deciduous bone, and are exuviated in course of time, as useless material. A study of the interruption of tooth development at certain stages gives useful information as to the series of changes by which the perfect form is evolved. The essayist cited a case in illustration in which the inferior right second permanent molar passed little beyond the saccular stage, the enamel and cementum being formed, but little or no dentine. It caused no pain, though much decayed, and was sore and loose. It had no roots, but was larger than the adjoining teeth, and much below them. It was hollow and spherical, and was made up of cementum and enamel. It is evident that had this tooth remained in the alveolus, its connection with the gum severed, and no other source of supply than the nutrient vessels from the alveolus, which would be sufficient only for the development of the cementum, that the granular mass of protoplasm receiving no nourishment would degenerate, and in all probability produce a dentigerous cyst.

DISCUSSION.

Dr. G. V. Black—I am puzzled to know how to open this discussion. I have looked over Dr. Patrick's paper, and I will probably find it necessary to disagree with him. We have not looked at the subject from a similar standpoint, and the same landscape may

appear differently when viewed from different or opposing aspects. His general description of the ovum and its segmentation is in the main correct, but it is not certain that the kidneys and urinary apparatus come from the mesoblast. He is probably right in saying that the tooth will be developed without connection with the nervous system, for we find that in some malformations no nervous system is present, and yet the child may grow nearly to term, and have teeth developed in accordance with its age. It is possible, then, that some teeth may grow without nerve development, but we generally find that these teeth are sensitive.

My friend has taken a view of the subject which surprises me somewhat, and yet macroscopic specimens, especially those preserved in alcohol, present very much the view that he has given us. You will find the epithelial cord, in macroscopic examinations, presenting the appearance he has described, and I have not found any vessels in it; but when it breaks up we will find vessels about it. (The speaker here illustrated the point on the blackboard.) The careless pulling of tissues apart is responsible for much error in judgment; they should be carefully cut *in situ*. We will find connection with blood vessels in different directions from those indicated by the essayist.

There are two other points on which I take issue with Dr. Patrick. One is that the enamel organ arises from the epiblast, not the mesoblast; the other, that dentine has generally begun to form before there is any cementum. As to the matter of absorption, which the essayist mentioned in his supplemental remarks on his paper as being a visionary theory, I will say that it is not in any degree a supposition. We may trace it in the hard tissues, as bones and teeth, and we know that a certain portion is being dissolved. It is the way in which the roots of temporary teeth get away, and also the roots of implanted teeth, and those membranes which are no longer useful in the development of teeth are removed in the same manner. The new thing to be done is done by new tissue, developed for the purpose.

Now as a tooth crown is developed, the enamel organ grows thinner and thinner, and finally disappears, and in the case of impacted teeth the enamel presents itself against the connective tissue in an abnormal relation, and hence in these cases we are liable to get cysts, abscesses, etc. The impacted tooth causes irritation,

usually about the time of the formation of its roots, when it is thrust forward against these tissues. The essayist drew attention to the fact that there was no dentine in the specimen he describes; but I have always found dentine present in deformed teeth, by making sections from them.

Membranes, such as the mucous, synovial, etc., are usually supports for a functioning tissue, as the epithelium which covers them. A capillary is a capillary by virtue of its pseudo-epithelium. (I use the word pseudo to represent the thelia developed from the mesoblast, in contradistinction to that from the epiblast and hypoblast.) I have found supernumerary teeth in the lower jaw, but they are very much more common in the upper jaw. I once saw a young lady with five incisors on the lower jaw, all in line, and I have also seen four inferior molars on either side, in the same mouth.

Dr. Carroll—I would like to ask Dr. Black if he regards the supernumerary teeth as mere accidental abnormalities, or an effort at a return to previous types.

Dr. Black—I regard them as mere vagaries. We find monstrosities in all forms of nature. We often see little buds growing from the epithelial cord, and the supernumerary teeth likely come from them. It is hardly possible to prove, but theoretically it seems probable. These teeth are generally deformed, but sometimes we get perfectly proportioned teeth, and this often leads to the careless extraction of a normal tooth instead of the supernumerary one.

Dr. Taylor—Why do these occur in the second dentition, and not in the first?

Dr. Black—It is difficult to tell why, but they do present themselves sometimes, even in the first dentition. I once saw an extra lateral incisor in a child four years of age.

Dr. Taylor—Will teeth be perfect in their formation when there is no direct nerve connection?

Dr. Black—I believe they will. I have seen a foetus where the nerves were absent, and yet the teeth were developed to term perfectly.

Dr. Patrick—I purposely avoided the question just raised by Dr. Black in his remarks, because in matters of physics I deal as little as possible in mere belief and speculation. The past history of scientific research shows that nothing has done so much to retard

progress as the interference of beliefs and speculations, especially when promulgated by ingenious men. But since this matter has been mentioned, I will give my idea about it.

In the drawing made by Dr. Black, there was a representation that the tooth dips down through the epidermis into the rete mucosum, and that there the enamel organ is met by a distinct projection of this deep-seated portion, and into which, by a system of invagination, it passes up into these enamel cells from the dermis. So it appears, according to this, that the tooth is made up of the epidermis, and the dermis—the epithelium and the rete mucosum—the epithelium dipping down to the rete mucosum, and the rete mucosum rising in the form of a papilla, projecting into the enamel organ. Now this papilla, arising from the deep-seated portion of the mucous membrane, which is said to be the dentine organ, is of course supplied with nutrient vessels. Yet we find the tooth is in a saccular stage before the roots are formed; that the dentine organ is a granular mass of protoplasm without vessels—or at least if the vessels are there they are not filled with blood, there being no connection at this portion of the sac with surrounding tissue—for while the fetal tooth is in this saccular condition it receives its nutriment by way of the funicle or umbilicus, and later from the cell wall. According to the drawing on the board, the sac would have to rise from the base of the papilla and envelop the enamel organ, make connection with the cord or funicle, and then be detached with the cord when the enamel passed through the sac. Now we do not find any such condition, and I defy any person to prove it.

Subject passed.

Quincy was selected as the next place of meeting.

The society honored itself in electing the following officers for the ensuing year :

President—Dr. Geo. H. Cushing, Chicago.

Vice-President—Dr. J. J. Jennelle, Cairo.

Secretary—Dr. Garrett Newkirk, Chicago.

Treasurer—Dr. T. W. Pritchett, Whitehall.

Librarian—Dr. W. B. Ames, Chicago.

Executive Committee—Drs. P. J. Keating, J. W. Curran, and J. W. Wassall.

Editorial.

ADVERTISING.

We have received a number of letters from esteemed correspondents, enclosing copies of newspaper cards and asking whether, in our opinion, they are contrary to the accepted code of dental ethics. In its proper sense, to advertise is to give notice, advice or intelligence; as "I will advertise thee what this people will do." (Num. xxiv, 14); and in this meaning advertising is entirely proper for dentists, or any professional man. But in its more modern sense, advertising is the extravagant laudation of merchandise, wares or commodities, which one has for sale. In this meaning, no respectable professional man can indulge in the practice. If he places his personal services on the same plane with the ready-made clothing of the merchant, to be sold to him who will pay the most, he is a huckster, and has no place with professional men, for his professional services are not reserved for those who are in distress, but are vended out to whomsoever can be prevailed upon to pay their price.

It is entirely proper for any professional man to advertise (apprise) people of a change of residence, for instance. He may, with propriety, inform them that his practice is confined to any particular specialty, or that he is prepared to perform unusual operations, such as oral surgery, or that he makes continuous gum-work, or obturators, or even that he keeps nitrous-oxide for administration. He may publicly present a card giving his office address and business, but he may not vaunt his skill, or claim superior ability, or boast of special and exclusive privileges. He cannot call attention to his unusually low prices, because these methods belong to trade, and not a profession. In short, it is the spirit which animates him and prompts his public notices that stamps his status. We have seen newspaper advertisements, occupying, perhaps, considerable space, which were not in contravention of the code of ethics, and we have seen three-line notices which were entirely unprofessional.

It is extremely difficult to reduce to a written code all the laws which should govern in professional matters. There is an unwritten law which is superior to all enactments, and which cannot be

infringed without branding the man as unprofessional. One cannot continually depreciate his professional neighbors and discourage their operations, without subjecting himself to the penalties of the written code. But there is a way of doing this without actual words, by a shrug of the shoulders, a turn of the lip, a sniff or a sneer, that will not come within the written law, but which will, perhaps, in even a greater degree, be unprofessional. Not only this, but it will be infinitely meaner and more rascally vile and dishonorable than an open, sweeping condemnation in words. See a newspaper card may be so contemptible in its implications, without actually overstepping the written code, that it is more unprofessional than the braggart vaporings of a silly fool.

A man may offensively advertise without resort to newspapers or handbills. He may affect peculiarities of dress, or of conduct on the streets, for the purpose of calling public attention to himself. He may seek notoriety in many ways, that shall mark him as a charlatan. He may continually boast of his great achievements, or of his overwhelming practice, in a manner that writes him down a professional quack. We have heard the most offensive advertising speeches in dental society meetings, and that, too, from men who would be the first to call out for crucifixion of the dentist who should publish a card in the newspapers. We have read accounts in the dental journals of the unvarying success in the treatment of certain diseases, by men who had the hardihood to affix their names to the braggart advertisements of their professional skill—men who actually claimed to be exempt from the common lot of mankind, and to be infallible and beyond mistakes. We have editorially struck out more than one such pitiful exhibition on the part of writers for this journal, for these are some of the most offensive forms of advertising.

We have heard of an obstetrician whose engagements extended a year in advance, and could not but wonder at the presumption exhibited by ——— somebody. But the braggart swaggering of this man has been exceeded by some of our modern dentists, who, if they may be believed, have their appointment books filled for a term almost equal to that of a natural life. Not long since we interviewed a dentist, who has not the reputation of possessing anything more than a respectably good practice, who has no assistant and who does any kind of work that is offered, boasting that each week he

rolled out from fifty to seventy-five dollars in coin for crown and bridge-work. A little calculation was all that was necessary to prove what an unconscionable liar and an offensive advertiser he was.

We might instance other ways in which dentists may unprofessionally advertise themselves. But the whole would be lost upon him who cannot see that the code of dental ethics is not an inflexible written law, by whose measured paragraphs the actions of men who claim professional status are to be judged. It is rather an indication, a sign, an intimation of that higher law, that elevated, pure, professional feeling which unerringly guides a man in professional ways, for he who prostitutes an honorable position to unworthy ends and purposes, who degrades a high calling to mere money-getting and sordid avariciousness, is not a professional man, no matter what may be his station or how correct his outward deportment. The true professional man is a gentleman, and in all his professional acts he will be prompted by gentlemanly instincts.

We might as well preach the sermon out, for the text, like charity, covers a multitude of sins. Dental journals sometimes, thoughtlessly we believe, encourage the advertising proclivity of dentists. One such proposes—for a consideration—to carry the name of any dentist who will pay the fee, for one year, in a conspicuous page especially devoted to this purpose. It is not difficult to imagine the class of dentists who will avail themselves of this delicate offer. Another publisher issues various editions of a so-called dental journal, and for a comparatively small sum will print a special edition of one of its issues, with the name of the patronizing dentist at the head as editor and publisher, a certain amount of the space to be devoted to advertising him personally, after the manner of the advertising sheets of dry-goods and clothing merchants. Such a thing *might* be made respectable and useful, but it is not at all probable that the money will be paid and the offer taken advantage of by a very reputable class of dentists. To our great surprise, we find the excellent and reputable *Archives of Dentistry* exchanging advertisements and offering clubbing terms with this affair.

Sometimes a young dentist who does not immediately leap into a great practice, dazzled by the apparent success of some advertising practitioner, is tempted to throw reputation to the dogs and sacri-

fice the esteem of his reputable brethren for the money which he expects to gain by unprofessional practices. He gets the idea that all one has to do is to advertise widely and recklessly, and certain pecuniary reward will inevitably follow. Now the real truth is, it requires greater business tact and ability to succeed by advertising than without it. The man who can make money in a profession by advertising, certainly could do so without it. Of all those who adopt this method, but a small percentage succeed. The ratio of failures among advertising dentists is much greater than among those who pursue a professional course, because all intelligent people comprehend the fact that an advertising professional man is an anomaly. They believe that there must be something radically wrong about him, or he would not be obliged to resort to methods which all recognize as disreputable. An advertising doctor, lawyer, preacher or dentist, is known to be at war with all respectable professional ideas, and his patrons as a class must be sought among the ignorant, the uncultured and the generally unpeccunious. Such men are usually regarded as quacks and charlatans, and if they succeed it is in spite of, and not because of, these methods. We have personally known a number of promising and able men who, not willing to wait for that plant of slow growth, public confidence, have entered upon a career of advertising, placed a great gulf between themselves and their professional brethren, and too late found out that success is not attained by violent measures. The only secure way is, by continued study and constant self-culture properly to prepare themselves for the service of their fellow-men, and by faithful work and honest, upright professional conduct, to prove themselves worthy of the patronage which, to such, will as surely come as the day follows the night.

SOMETHING OF INTEREST.

In this number is published the introduction to a series of articles by Dr. Miller, upon "Pathogenic Bacteria of the Human Mouth," which, if we may judge by the matter already in hand, will fully equal in value and interest anything that has yet been published from his pen. The drawings that we have received indicate—what had already been established—that he is quite as happy with the pencil as with the pen, and if we succeed in having them faithfully reproduced they will be as valuable to every student

of scientific dentistry as is the text. Prof. Miller now stands first in his chosen field, and when he speaks it is as one having authority, for the thorough and exhaustive studies and observations in which he has for years been engaged, a protracted series of connected experiments extending over long periods of time, all conducted in accordance with the most rigid scientific law, enable him to draw definite and positive conclusions when such are possible. There is probably no one now living who is so thoroughly versed in oral bacteriology as is Prof. Miller, and the results of his exhaustive research will be laid before the readers of THE INDEPENDENT PRACTITIONER in the series of articles now just commenced. We need not ask their careful reading, for no dentist who makes any pretense to even the most superficial knowledge of the subject can avoid their study.

When the results of the observations of Pasteur, Koch and others in bacteriology were first published, and the attention of the medical men and scientists of the world was absorbed in the new revelations, two schools of pathologists sprung up, the first claiming, with the renowned observers, that the micro-organisms were the sources of contagion and the direct cause of the diseases to which they were peculiar, and the second that they were but the accidental occupants of the products of diseased action, which were their natural habitat; that they were scavengers, proliferating within and rendering innocuous septic matter. The debate between the adherents of the two theories was sometimes determined and bitter, the arguments on each side being met with rebutting testimony, and experiment encountering experiment. It seemed extremely difficult to positively demonstrate beyond the reach of cavil the truth of either theory. But when Prof. Miller, by means of pure cultivations of the *delta* organism (Miller), artificially produced true caries of the human tooth, as first published in THE INDEPENDENT PRACTITIONER in 1884, a fact was established which there was no gainsaying, and the opponents of the theory of the pathogenic character of certain bacteria were effectually silenced.

The man who did this, who artificially produced such definitive changes in a tissue like that of the human tooth when removed from all vital connection, may well be allowed to speak authoritatively on oral pathology, and those who have any respect for earnest, painstaking, scientific investigation, will listen respectfully

to what he has to say, for he has demonstrated his fitness to stand as a teacher.

In this connection, it gives us pleasure to announce that Prof. Miller will visit this country during the coming summer. He will arrive about the middle of August, and will remain for some weeks. But he comes for rest and recuperation—a rest well needed—and he will not probably be able to engage in any professional work in this country.

CREOSOTE VERSUS CARBOLIC ACID

There is a curious lack of comprehension of the wide difference between creosote and carbolic acid. Some of our most intelligent men use the terms interchangeably and as synonymous. The fact is, the two articles have little in common. As medicinal agents they are, or should be, employed for widely different purposes. And yet dentists frequently recommend the one when they mean the other. Creosote has but a very unimportant place in the dental pharmacopœia, while carbolic acid is, perhaps, employed more frequently than any other remedy. There are very few of the dentists who so commonly advise its use in their writings or speeches, who even have it in their cases. Indeed, it is not fit for exhibition in the operating room, because of its oppressively vile and penetrating odor. Let us review some of the characteristics of each, that it may be judged which of the two is best adapted to dental wants.

Creosote is obtained from wood, carbolic acid from coal tar.

Creosote, when pure, is a liquid, carbolic acid a solid.

Creosote will not coagulate colloidum, carbolic acid will.

Creosote will not produce a blue color by reaction with mercuric acid, carbolic acid will.

Creosote forms solutions with eighty parts of water, and with one-tenth of one part, carbolic acid with twenty parts.

Creosote is not a cauterant, carbolic acid is.

Creosote is a narcotic, carbolic acid is an irritant.

Creosote is an oil, carbolic acid is a phenolic alcohol.

Creosote has for its formula $C_{10}H_{12}O$, carbolic acid is composed of C_6H_5HO .

Creosote is a soothing application to ulcers and for post-tracheal throat, carbolic acid is exceedingly irritating.

Creosote is styptic and astringent, carbolic acid is not.

Finally, and most important, creosote is not a germicide or a disinfectant at all, while carbolic acid is one of the most powerful with which we are acquainted.

Will not dentists take note of these differences, and use and recommend the two drugs intelligently. Medical men who know the characteristics of each, are not impressed with our chemical and pharmaceutical lore when they hear us prescribing creosote for the septic canal of a tooth.

A COINCIDENCE.

A curious instance of the independent invention of a surgical instrument by two men under widely different circumstances, and for distinctly separate purposes, is revealed by the communication in our April number from Dr. Rollins, and in one from Prof. Busch, Director of the Dental Institute of Berlin, in this. The character and standing of the two men forbid the thought that either should have borrowed his idea from the other, even did the circumstances of the case not do so.

Dr. Rollins is known as an ingenious and original man, who has sometimes been too careless in placing on record in dental journals, where they properly belong, the facts concerning his discoveries, and hence the material which he has delved from the mine of his brain has sometimes been utilized by others, without giving him the credit that is due him. Prof. Busch needs no defense against a charge of unwarrantably seizing the ideas of another. Those who met him at the International Medical Congress last summer, and who listened to his addresses, although delivered in a foreign tongue, were too deeply impressed with his evident candor and honesty, as well as his earnestness and ability, to believe for a moment that he could be professionally dishonorable. Besides, the journal which he sends us proves that he made a record of his invention as long ago as 1884. The facts are undoubtedly just as he states them in his letter to this journal, and it affords another instance of the independent invention of an appliance by two persons.

SUPPORT THE JOURNALS.

In the report of the meeting of the Illinois State Dental Society, in this number, will be found some sensible and timely remarks concerning the duty that dentists owe to their professional jour-

nals. There can be no "profession" without a literature of its own; the very term implies literary culture. If those engaged in any vocation are doing scientific work, there must be journals of some kind to make a permanent record of what is done, and these journals will usually be a faithful index of the status of those whom they represent. The stream cannot rise above its fountain head, and if dentists desire a literature that will be a credit to them in the eyes of the world, that shall produce the impression that they are thinking, studious men, the journals must be supported, not only with subscriptions, but by contributions from the writers of the profession. Our dental journals usually have a large exchange list of medical journals, and the impression that is made upon the editors of those journals, upon the representative men in medicine, depends to a large extent upon the manner in which they see our professional literature sustained. If any journal that stands as a representative of the profession to which it belongs shall mainly be made up of extracts from other journals, and evince a dearth of original thought and a lack of original commentation from those who should be its contributors, it marks a low tide of professional interest and reflects severely upon professional status.

TO SUBSCRIBERS.

With this number will be sent out the usual bills for those who are in arrears for subscription. Will not each reader who finds this delicate reminder, kindly remit what is due without delay. We think that we have honestly earned the money, and as this journal has nothing to depend upon save what it receives from its patrons, prompt payment is a necessity. There are a few who owe for more than one year. We earnestly ask such to remit at once. The amount may be small to them, but the aggregate to us is considerable, and its collection is an absolute necessity.

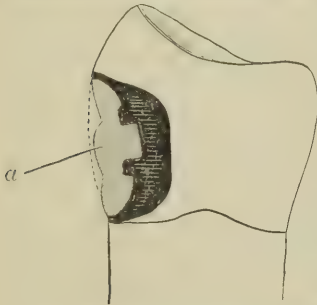
ANNOUNCEMENT.

THE INDEPENDENT PRACTITIONER, after this number, will appear under different management. A new and enlarged syndicate has been formed for its publication, to which the old publishers have transferred the journal. It will, however, remain substantially the same as now, except that its scope and opportunities will be enlarged. The negotiations were not concluded until it was too late to say more in this number. The next will explain matters fully, and the new management will lay their plans before the profession.

Current News and Opinion.**CONCERNING EROSION.**

BY W. D. MILLER.

The question of the etiology of erosion (abrasion, denudation) is one which, however much it has been discussed, is little nearer a definite solution to-day than it was twenty years ago. Nor is it my object now to make any attempt at an explanation of the phenomenon. I simply desire to record an experiment which definitely settles the question as to whether or not erosion occurs in pulpless teeth. We have all seen pulpless teeth which presented extensive erosions, but we have not been able to say that these erosions were not produced while the pulp of the tooth was still alive, and, as far as I am aware, no one has succeeded in refuting beyond all doubt the assertion that erosion attacks only teeth with living pulps. The following experiment is therefore of considerable value, inasmuch as it definitely settles the question at issue.



On the 7th of April, 1886, a piece of ivory was set, by means of cement, in the cavity of a right inferior bicuspid, where the loss of substance by erosion was so extensive that it would have exposed the pulp if the latter had not been protected by secondary dentine. The piece of ivory at the time it was set had the form represented by the dotted line in the figure. On the 23d of April, 1888, a little more than two years later, it presented the appearance seen at *a*, in the figure in cross section.

The piece was then removed for examination, and showed two very distinct parallel horizontal furrows. The surface had the very fine polish characteristic of abraded dentine. No one examining the piece of ivory would hesitate for a moment to pronounce it a typical case of erosion.

THE CONSTRUCTION OF ARTIFICIAL DENTURES.

At the twentieth annual meeting of the Eighth District Dental Society, held in Buffalo, April 17 and 18, Dr. Geo. B. Snow made some valuable and practical remarks upon the proper method of proportioning artificial plates, those made of rubber, especially, that perfect and distinct enunciation may be secured. He said that if the cast of a jaw in which the natural teeth are in place be sawn longitudinally through the centre, and the contour of the palatine surface carefully studied, it will surprise most dentists. Nor will there be any great departure from the same general line, no matter what may be the shape of the mouth. A prominence will be seen just back of the anterior teeth, and it is against this that the tongue rests in the production of many of the sounds of articulate speech. When the teeth are extracted this prominence is soon lost, and it is not entirely due to the absence of the teeth that the imperfect articulation of edentulous persons is due. This prominence does not exist, and hence the tongue

does not perfectly rest against the anterior portion of the jaw, so it is necessary in giving the sounds of d, t, g, j, and others of the letters of the alphabet.

When an artificial plate is constructed, it is usual to make it as thin as possible at this very point, where it should be thick, and hence the speech of those using gold plates, especially, is usually very indistinct. The annexed imperfect cut will illustrate this. The heavy line is about that of the usual jaw with natural teeth, and at "A" is the prominence referred to. The dotted line is that of the ordinary artificial denture. The proper contour is obtained by adding to the thickness of the plate at the right



point, until the natural contour is approached, and a prominence thus formed for the tongue to meet in articulate speech. If, then, the natural curve of the mouth can be reproduced, it will materially aid speech. But the plate should be made especially thick where it is usually thin, and the added material should be so shaped as to reproduce the natural prominent ridge. Those who have experimented in cases in which there was a very disagreeable sibilant sound, or hissing, in conversation, will remember that if they overcame the difficulty it was not by making the plate thin at the anterior portion of the vault, but by adding to its thickness. The objectionable sound is caused by the escape of air through the imperfect occlusion of the tongue with the anterior portion of the roof of the mouth. If additional thickness be given the denture at this point, it also adds to its strength just where rubber plates usually are weakest. Continuous gum plates usually give the clearest enunciation, because they are thick at the essential point, by the addition of the ridge.

CORRESPONDENCE.

Editor Independent Practitioner:—

The article by Dr. W. H. Rollins in the *INDEPENDENT PRACTITIONER* for April, 1888, page 212, induces me to make a short reply, which I beg of you to publish in your excellent Journal. The instruments which I exhibited in the Section of Dental and Oral Science of the Ninth International Medical Congress were not "circular," but "tubular" knives. I have used such instruments for the excision of moles from the skin of the face since 1884, and published a communication in the *Berliner Klinische Wochenschrift* for 1884, p. 389, on the extirpation of small round excrescences of the skin by means of quickly rotating hollow irons (*Schnell rotirende Hohlmeissel*). I take the liberty of sending you the number of the Journal referred to. A short time after I accepted the direction of the Dental Institute of the Berlin University, I had some tubular knives made for the dental engine according to my own design, at the dental depot of Paul Russ, of this city, and used them for the purpose stated above. In September,

1887, I exhibited the instruments at the International Congress, together with about thirty moles removed by their means. To my great astonishment I saw exactly similar instruments in New York, in the depot of the S. S. White Dental Manufacturing Co., and learned there that they were designed in America by Dr. Rollins, and described in the December number of the *Dental Cosmos* for 1886, p. 789.

From these statements, which can be substantiated by the literary evidence, you will perceive that the charge made against me by Dr. Rollins of having appropriated his invention is unfounded, the fact seeming to be that the same thing was simultaneously designed on two continents, by two men who knew nothing of each other, for different purposes, however. Dr. Rollins intended it for cutting the gums and the periosteum in the transplanting of teeth, while I used it for the cutting out of moles from the skin of the face. I can only admit Dr. Rollins' priority in the invention of the tubular knife for the dental engine, when he can prove that he made a publication of his design prior to April 9, 1884.

PROF. DR. BUSCH,

BERLIN, April 24.

Director of the Dent. Inst. of Berlin.

Editor Independent Practitioner:—

Will you kindly publish in the next issue of your Journal the correct interpretation of the law just passed, amending the Dental Act in this State. Does it throw out of employment all persons now engaged as assistants in operative dentistry? Many of these have been so employed for many years—some since before the passage of the original act of 1879—and to-day they are as competent to perform skillful operations as many of the licensed practitioners. Is it intended to deprive the old assistants of the means of earning a livelihood, and to oblige them to give place to the young and inexperienced student?

Your interpretation of the law will be greatly appreciated by all readers of the PRACTITIONER.

50 West 35th Street, New York, }
May 14, 1888.

P. M. HARDER,
Ass't in Operative Dentistry.

ANSWER.

The editor of this Journal does not pretend to be an expounder of the law. He was not consulted in the drafting of the amendment, and has little knowledge of its history, save that it was intended to prevent the practice of unqualified men under cover of the name of a registered dentist. In many cases, those who possessed the necessary certificate have outraged decency and enabled others to violate the plain intent of the law, by a pretence of ownership of a branch office in which a student or other unqualified man was permitted to practice. When suit was brought, the more unscrupulous quack of the two would make oath that the office and practice were his, and the lesser charlatan was his hired assistant. In some instances, a dentist has established a chain of offices in which he has installed his students, and thus practiced quackery by wholesale.

These were the men and this the practice at which the new amendment was aimed. In all the legislation that has been secured, it was the earnest desire of

those who advocated it that no vested right should be interfered with, an injustice done to any one. But it is not always possible to get through such a bill as is desired. So many ward caucus-statement men who are in the Legislature must be consulted, that their opposition may not be encountered, each of them knowing infinitely better what is wanted than the parties interested, that by the time they are through with tinkering and patching it is but a shreds and remnant at best, and the parties are obliged to accept or see it fall altogether.

Nine years should certainly be sufficient time for an assistant who has any interest in his vocation to qualify himself under the law. If he has not done so the fault lies with himself. We think all may rest secure in the assurance that the bill will not be so interpreted as to make it oppressive to any worthy man.

THE ETHICS OF THE MEDICAL PROFESSION.

"Usually the clergy do not comprehend the ethics of the medical profession better than the laity. Generally, the publication of religious as well as secular journals approve of the quack and condemn the honest, regular practitioner. Of the golden rule, as applied to medical men in their professional work, the clergy are, as a rule, utterly ignorant. But a writer in *The Protestant Christian Advocate*, while discussing "Ministerial Quackery," makes the following remarks about the medical profession. It will be the more appreciated because of its rarity. It is the first ray of that rising sun which shall one day illuminate the entire world respecting the ethics of medical men—"

"It is a noteworthy fact that the medical profession has, more perfectly than any other, maintained its high and pure standard of excellence, and all the time made steady and substantial progress. There is something significant in this when we remember that this profession has kept its face against all forms of quackery. It recognizes as a great truth that the interests of humanity demand that a physician and his work should be estimated solely by their real worth. The man who advertises his excellencies, or has himself thus advertised, is suspected at once as being shallow, if not fraudulent, and being conscious of his deficiencies and his inability to pass on his real merit, he resorts to the newspaper as a means to catch patronage from light heads and the unthinking. The code of ethics of this profession is steadily against all humbuggery, and we note with pleasure that meekness and mockery has not yet been required from the code. We readily see that a man in this profession is thus kept upon that high plane where his eye is ever fixed upon an ideal that is pure and elevated, and worthy of a man."—*American Literature*.

DR. J. N. FARRAR'S BOOK.

The first volume of the work of Dr. Farrar on "The Correction of Irregularities of the Teeth" was promised the profession before this time, but it has been thought advisable by the author to hold it until the second volume is ready for issue, that it may more nearly appear as a perfect work. The editor of this journal has lately had an opportunity to examine the proof sheets—for the first volume is in type—and he feels assured that nothing will be lost by the delay. The work will be very exhaustive and complete, and its scope such as to cover all, or nearly all, the abnormalities of the human dentition. Particular care has been exercised in tracing out the origin of the various appliances used in the

correction of irregularities, and everything of importance is described and illustrated. Indeed, in the matter of cuts the book will be especially rich, there being about 1,400 in the two volumes of 650 pages each.

OBITUARY.

DIED.—In New York City, May 19. 1888, Chauncy P. Fitch, M. D., in the seventieth year of his age. Dr. Fitch was at one time a prominent and well-known member of his specialty. Some years ago he took an active part in society gatherings, but latterly he took very little interest in such matters, seldom meeting with his professional friends. He was born in Vermont, and lost his father when quite a youth. For a time thereafter he worked in the printing office of his uncle, finally taking up the study of medicine and graduating from the University of Pennsylvania. He located in New York a quarter of a century ago, where he has ever since practiced dentistry. He was President of the American Dental Association in 1866, at its meeting in Boston, was one of the founders of the New York College of Dentistry, and aided materially in procuring its charter. C. E. F.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

The twentieth annual meeting was held at Albany, Wednesday and Thursday, May 9th and 10th. The following members were elected as officers for the ensuing year:—

President—J. Edward Line, Rochester.

Vice-President—C. F. Rich, Saratoga Spa.

Secretary—Myron D. Jewell, Richfield Spa.

Treasurer—H. G. Myrick, Brooklyn.

Correspondent—G. L. Curtiss, Syracuse,

Censors—Second District, Wm. Jarvie, Brooklyn. Fifth District, S. B. Palmer, Syracuse.

Six candidates passed the examination of the Board of Censors and received the degree of Master of Dental Surgery.

SUSQUEHANNA DENTAL ASSOCIATION.

The twenty-fourth annual meeting of this Society was held at Scranton, Pa., May 16th and 17th. The annual address was made by the President, Dr. J. D. Wingate, of Carbondale. The following were elected officers for the ensuing year:—

President—B. F. Van Buskirk.

Vice-President—J. L. Fordham.

Treasurer—H. Gerhart.

Recording Secretary.—V. S. Jones.

Corresponding Secretary—C. F. Meaker.

Executive Committee—C. S. Beck, J. D. Wingate, H. C. Sticker.

AMERICAN MEDICAL ASSOCIATION.

The thirty-ninth annual meeting was held in Cincinnati, Ohio, May 8, 9, 10 and 11. The officers elected for the ensuing year are:—

President—W. W. Dawson, Ohio.

First Vice President—W. L. Scheuck, Kansas.

Second Vice President—Frank Woodhury, Pennsylvania.

Third Vice President—H. O. Walker, Michigan.

Fourth Vice President—J. W. Ballou, Georgia.

Treasurer—R. J. Dunglison, Pennsylvania.

Secretary—Wm. E. Atkinson, Pennsylvania.

Librarian—C. H. A. Kleinschmidt, District Columbia.

Section of Dental and Oral Surgery—Chairman, F. H. Edwards, Ohio; Secretary, E. S. Talbot, Illinois.

The next meeting will be held at Newport, R. I., the second Tuesday in June, 1889.

IOWA STATE DENTAL ASSOCIATION.

The twenty-sixth annual meeting was held in the Hall of the Dental Department of the Iowa State University, Iowa City, Tuesday, Wednesday, Thursday and Friday, May 1, 2, 3 and 4. President W. P. Dickinson, of Dubuque, presided, and the meeting was one of interest and profit. The following were elected officers for the ensuing year:—

President—J. B. Monfort, Dubuque.

Vice President—L. K. Fullerton, Waterloo.

Secretary—G. W. Miller, Winterset.

Treasurer—F. M. Shriver, Glenwood.

Des Moines was selected as the next place of meeting.

NEW HAMPSHIRE DENTAL SOCIETY.

The twelfth annual meeting of the New Hampshire Dental Society will be held in Concord, June 17th, 1888, at 11 o'clock.

Efforts are being made to have this meeting the best ever held by the society, and all dentists of the State are earnestly requested to be present.

The Board of Censors will meet at 1 o'clock p. m., June 18th, for the examination of candidates for license to practice in the State.

EDWARD B. DAYIS, Secretary.

88 N. Main St., Concord, N. H.

PENNSYLVANIA STATE DENTAL SOCIETY.

The twentieth annual meeting will be held in Philadelphia, commencing Tuesday, June 5th, and continuing three days. Special rates have been secured at hotels and upon the railroads, and a more than usually interesting meeting is confidently anticipated.

LA NATURE, in an article on "Umbromania," thus speaks of the shape of the hand with reference to manual dexterity :

Thirty-five years of research have permitted M. Etienne, who has been continuously in contact, in shops, with Swiss watchmakers' apprentices, experienced workman, and artists even, to find a certain criterion by which to judge of aptitudes in different trades and several professions.

A young Frenchman who, after reverses of fortune, was desirous of giving up the study of the law in order to learn watchmaking, presented himself one day before M. Etienne at the shop of a skillful master of apprenticeship, who received the intelligent countenance with eagerness; but while pressing the hand of the future apprentice, a cloud passed over the face of the placid master clockmaker. "What did you feel then in pressing the hand of that young man who has just gone out?" asked M. Etienne "With hands like his, we don't make a watchmaker," was the reply, and the prediction came true. It was as a consequence of this conversation that M. Etienne sought and discovered the following rules, that we think we can reproduce without straying from our subject.

The characteristic of dexterity is shown in the first place by *the curve of the thumb arched outwardly*. This is an indispensable condition for the handling of the hammer. The blacksmith who wields with his arm the heavy striking mass that he lets fall perpendicularly, without deviation, repeatedly upon the same point, the file cutter, who strikes so regular blows upon the chisel that no flaw is visible in the cut, so equal everywhere is the imprint of the tool—these and all superior workmen, all artists who shape hot iron with the hammer, who chisel the precious metals, who sculpture marble and stone, owe the exact precision in the force and accuracy of the blows that they give with the hammer to the suppleness of the first joint of the thumb. To this natural gift they owe their fortune, for, in shops, selection is made, to the profit of the most skillful, of those alone to whom the most difficult and most delicate work can be entrusted.

A second characteristic of skillfulness is indicated by the faculty of reversing the metacarpal phalanges of the fingers, so that when the hand is extended it is convex. On the greater or less flexibility of all the joints, either at the bone or extremity of the fingers, depend the dexterity and skillfulness displayed in work executed with the file, the plane, or lathe.

This suppleness cannot be independent of that of the thumb, but it does not replace it, while the curved thumb will more easily dispense with the great flexibility of the other fingers. The two characteristics are in most cases united.—*Scientific American*.

It will be remembered that the ingenious Daniel Doyce, in Dicken's "Little Dorrit," turned a spectacle case in his hand "with a certain free use of the thumb, that is never seen but in a hand accustomed to tools."

DR. WILLIAMSON exhibited recently to the Odonto-Chirurgical Society of Scotland an interesting case of fracture of the root of a central incisor which bore evidence of having been united. There was a history of a blow in child-

head, from which the right incisor received so much injury that its pulp died, as was shown by its discolored appearance. But both teeth had done good service until the patient reached the age of 45, when the left central became so loose that it was removed by the fingers. A part of the root, however, was left behind, but being loose, it was easily extracted. On examination it was found that the two fragments fitted accurately when placed in apposition, except where there was a little chipping at one edge. The fracture of the dentine was at a higher level than that of the cementum, so that the latter formed a sort of collar for the lower fragment. There was some thickening in parts of the cementum, and the whole of the pulp in the osseous fragment was calcified, and also the part close to the line of fracture in the other piece.—*Lancet*.

THERE SEEMS to be almost no end to the new hypnotics, narcotics and local anesthetics, offered to the medical profession since the discovery of cocaine. The most of them, it is safe to say, are like "Gloditchine," of imaginary machinery—made to sell. The latest aspirant has been mentioned by very high authority. *The British Medical Journal* says of it: "Boldin is the principle obtained from boldo leaves, and Dr. Jumanville highly praises it in a recent number of *Le Progrès Médical*, as a hypnotic far exceeding opium and alcohol. This is saying a good deal for it. We are told also that boldin is not disagreeable to take, has no unpleasant effects, increases the appetite, and has a "strengthening" influence on the patient. Between five and ten grains were given daily to various patients. The sleep induced by this substance is of a natural kind, and the breathing is regular and tranquil. Boldo leaves contain about three per cent. of boldin. It may be given in capsules in doses of 0.2 grams (three grains), repeated as necessary, or diluted 1 in 20 in watery solution."

IT WILL GIVE PAIN to many hearts to know that death in a peculiarly repulsive guise visited the home of the honored Prof. J. Taft of Cincinnati, on the fourteenth of April last. On that date Mrs. Taft was returning from a visit to her son, and alighted from a street car, when a train upon the Ohio and Mississippi Railroad, which passes the house, came thundering along, struck and hurled her to instantaneous death. Mrs. Taft was devoted to home and its duties—a home which, deprived of its central figure, can never again be what it was. The sympathy of a whole profession is extended to the survivors of this so long united pair, and the wish is fervent that he may not be again called upon to pass through deep affliction.

A LAW DISPENSARY has been established in New York, under the auspices of the People's Mission, for the benefit of the poor who require legal advice and cannot afford to pay for it.

What business has a poor man with law? If they would dispense justice, it might be a work of genuine charity.

THE BRITISH DENTAL ASSOCIATION meets in Dublin this year and a large attendance is expected. The meeting will be held in August. This is the governing body of the dental profession of Great Britain.

DR. H. W. PARSONS, of Wamego, Kansas, more than a year ago sent the editor of this journal some amalgam for practical tests. It has been possible with it to make fillings that seem as near perfection as can be attained with that material. Some very large contour work bears a polish like that of gold; the color remains excellent, while there is no appearance of shrinkage or drawing away from the walls of the cavity. Other practical tests made with it show quite as good results.

Some large fillings made with an oxy-phosphate cement, prepared by him, have been in the mouth since August last, with apparently no change or disintegration. We have used it for setting gold crowns and for other work, with great satisfaction.

WE HAVE, in a previous number, spoken of that magnificent work, "Photographic Illustrations of Skin Diseases," published by E. B. Treat, 771 Broadway, New York. We are in receipt of parts five and six, and they fully sustain the high reputation won by previous numbers. The hand-colored plates of Pityriasis, Lichen, Herpes, Zoster, and other skin diseases, are marvelous productions. The work will be completed in twelve parts.

"PROFESSOR, what are your views concerning the schools of medicine and theology?"

"That depends upon circumstances. When I am slightly ill I am a homœopathist and a Unitarian; but when I am very sick I am an allopathist and a Calvinist."—*Am. Prac. and News.*

THE ATTRACTIVE SIDE of "Hospital Life" is presented in *Scribner's* for June, by one who looks at it from a patient's point of view. It contains bits of humorous and pathetic character sketching. J. Alden Weir, W. L. Taylor, and other skillful artists made the drawings in the New York and Brooklyn hospitals to illustrate it.

IN THE CHEMICAL LABORATORY. "Professor, what has become of Appleton? Wasn't he studying with the class last year?" "Ah, yes. Appleton—poor fellow. A fine student, but absent minded in the use of chemicals—very. That discoloration on the ceiling—notice it? Well, that's him."

THE SOUTHERN CALIFORNIA PRACTITIONER breaks the record with an account of a quartette medical wedding at Los Angeles, California, as follows:

H. Bert Ellis, M. D.; Lula Talbot, M. D.

F. D. Ballard, M. D.; Rose Talbot, M. D.

DRS. G. V. BLACK and J. W. Wassall, of Chicago, will visit Europe during the summer, and remain abroad for some months. Dr. Black will pursue some special studies during his absence.

PHILADELPHIA has four dental journals, according to Caulk's Annual. New York has but one, but that one is the INDEPENDENT PRACTITIONER.

THE Independent Practitioner.

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NO. 7.

NOTE.—No paper published or to be published in another journal will be accepted for this department. All papers must be in the hands of the Editor before the first day of the month preceding that in which they are expected to appear. Extra copies will be furnished to each contributor of an accepted original article, and reprints, in pamphlet form, may be had at the cost of the paper, press-work and binding, if ordered when the manuscript is forwarded. The Editor and Publishers are not responsible for the opinions expressed by contributors. The journal is issued promptly, on the first day of each month.

Original Communications.

PATHOGENIC BACTERIA OF THE HUMAN MOUTH.

BY PROF. W. D. MILLER, BERLIN, GERMANY.

CONTINUED FROM PAGE 284.

The first experiments upon animals showing "the poisonous nature of the human saliva" were, I believe, made in America. The injection of saliva under the skin of small animals was frequently seen to be followed by septicæmia and death of the animal in a few days, or even hours. Similar results were obtained by Pasteur, Raynaud and Lannelongue, in Paris.

A. Frankel¹ mixed saliva from healthy persons with *Bacillus*, and allowed the mixture to stand four to six hours at blood temperature. Rabbits vaccinated subcutaneously, or in the lung, died from blood poisoning in twenty-four to forty-eight hours. Occasionally Frankel obtained the same results by vaccinating animals with fresh saliva. Also Miller,² by inoculating rabbits and mice with the saliva of an individual suffering from mycosis tonsillaris benigna. Inoculation in the lung was regularly followed by death of the animal within thirty hours. In like manner the experiments of Haverhill,

¹ Deutsche Med. Wochenschrift, No. 25, 1882.

² *Ibid.*

Vulpian, Klein, Sternberg and others proved, beyond a doubt, that a group of micro-organisms is frequently to be met in the human mouth, which, having found their way into the circulation, may produce the most dangerous diseases.

Kreibohm¹ has furnished an important contribution to our knowledge of the pathogenic micro-organisms of the human mouth. He found, in the first place, two kinds of bacteria, which were characterized by the fact that they grew on none of the culture media now in use. The first kind was obtained twice by inoculating mice with the scrapings of a coated tongue. The mice died in a few days, and showed, on section, large numbers of bacilli in the blood. One drop of blood of these mice, inoculated into other mice, produced constantly the same disease. Death followed, as a rule, in two to three days.

The second kind was obtained in the same manner. Inoculation with this bacterium produced death in eighteen to forty hours. The micro-organisms were found in great numbers in the blood and in the capillaries of the different organs. They appeared as short rods, slightly contracted in the middle; after staining they have the appearance of an 8. Kreibohm also found once in the coating of the tongue and twice in saliva, a bacterium which he named *Bacillus crassus sputigenus*. It appeared as short, thick bacilli, with rounded ends, or often bent in the form of a sausage. The cultivation succeeded easily on different media. Mice die in about forty-eight hours after inoculation with small quantities, and show in the blood numerous bacilli. Rabbits do not react on slight vaccination, but die from blood poisoning forty-eight hours after intra-venous injections.

Black² examined the fluids in the mouth for pyogenic bacteria, and found in ten examinations, the *Staphylococcus pyogenes aureus* seven, *Staph. pyog. albus* four, and *Streptococcus pyogenes* three times. He came to the conclusion that a careful examination would reveal these micro-organisms in nearly all mouths.

The *Micrococcus tetragenus* has been repeatedly found by myself and others in the fluids of the mouth. It possesses, as is well known, pathogenic properties, and causes the death of small animals (mice, guinea-pigs, etc.) in three to ten days after vaccination.

¹ Flügge, *Mikroorganismen*, S. 257.

² INDEPENDENT PRACTITIONER, August, 1887.

Still more recently, Biondi¹ has described five pathogenic organisms obtained from the human mouth:—

1. *Bacillus salivarius septicus*.
2. *Coccus salivarius septicus*.
3. *Micrococcus tetragenus*.
4. *Streptococcus septo-pyemicus*.
5. *Staphylococcus salivarius pyogenes*.

The *Bacillus sal. sep.* forms very short elliptic rods, with pointed ends and relatively thick body, and grows only slowly on the ordinary neutral media. Mice and rabbits, after injection of 4-1 ccm. of saliva containing this micro-organism, died generally in twenty-four to seventy-two hours; the section showed oedem, hemorrhage, tumor of the spleen, etc. The *Coccus sal. sep.* was found by Biondi only once, in the mouth of a patient suffering from puerperal septicæmia. Mice, guinea-pigs and rabbits, inoculated subcutaneously, died in four to six days with cocci in the blood and tissues. The *Streptococcus septo-pyemicus* was not to be distinguished from that of erysipelas, phlegmon and puerperal metritis. Its action was also similar. The *Staph. sal. pyog.* was found only once, in the saliva of a person suffering from angina scarlatina. All animals infected with this micro-organism reacted by formation of abscess at the point of vaccination.

Two of these organisms, described by Biondi, *Staphylococcus sal. pyog.* and *Coccus sal. sept.*, were found, each but once, in the mouth of persons suffering from severe infectious diseases, and can therefore hardly be considered as oral bacteria, any more than the tubercle bacillus, which may always be found in the mouths of consumptives.

Notwithstanding the great amount of work done upon the bacteria of the human mouth in the last few years, an immense amount remains to be done before we can be said to have arrived at anything like a thorough knowledge of the oral bacteria. Indeed, this field of work is so large that the longer one works at it the more bewildering it becomes, until at last one despairs of ever being able to make a thorough study of all the many different kinds of bacteria met with in the human mouth. Some three years ago I had already isolated, and in part described, some sixty different bacteria from the oral cavity; my work being then interrupted, I allowed

¹ *Bresl. Arch. Zeitschr.* 31, Sept., 1887, No. 35.

nearly all of the cultures to die out. Among the fifty to sixty different kinds which I have cultivated in the last eighteen months, I recognize very few which I might possibly consider identical with any of those previously isolated. I have, consequently, from first to last, found more than one hundred species of bacteria in the human mouth. Any one who has done even a very little work in experimental bacteriology will at once recognize the absolute impossibility of any one person making a detailed study of one hundred different kinds of bacteria. One kind may furnish material for a life-work. I have, consequently, aimed only at general results, and in the case of but a very few have I attempted to make a more thorough study.

I have experimented with forty-two pure cultures, two mixed cultures, and twenty-two gangrenous pulps, and have made ninety-three subcutaneous inoculations of mice in pockets, using pure cultures, ten subcutaneous injections of pure cultures, fifty-eight pocket inoculations with pieces of gangrenous pulps, or with pus arising from such inoculations, sixty injections of pure culture into the abdominal cavity of mice, rabbits and guinea-pigs, twenty-two injections into the thoracic cavity, besides a number of mixed injections.

The pockets were made in the customary manner, at the root of the tail, and the material for inoculation was usually taken from an Agar-Agar culture one to two weeks old. Injections were made with the sterilizable subcutaneous syringe, cultures in beef-extract-peptone solutions from two to four days old, being used. For mice, 0.05 to 0.1 cc.; for rabbits and guineapigs, 0.25 to 0.5 cc., were injected. The mice were always etherized before making the injection. The etherization renders the operation much easier and surer; it may be accomplished in fifteen seconds by taking the mouse by the tail and poking him into a wide-mouthed ether bottle.

In 18.8 per cent. of the pocket inoculations a severe local reaction followed, resulting in the formation of a small abscess, generally remaining superficial, but occasionally penetrating into the subcutaneous tissue. In eight cases the inoculation was followed by death, the mice showing, in three cases, symptoms of blood poisoning, the micro-organisms being also present in the blood and different organs. In a number of cases necrosis of the skin around the pocket occurred, a piece of skin one-fourth to one-half

inch in diameter being thrown off. In 30 per cent. the reaction was light, nothing more than a slight local redness and formation of a very minute quantity of pus being observed. In 21.2 per cent. no reaction whatever could be detected, the wound healing rapidly, without either suppuration or swelling. Of the different kinds tested by injections, 24 per cent. produced violent reactions, resulting either in the death of the animal from septicaemia, peritonitis, pleuritis, etc., or in extensive suppuration and abscess formation. Slight reaction was produced in 32 per cent., temporary sickness, from which the animals soon recovered, or slight swelling at the point of injection; in 44 per cent. no effect could be detected.

Subcutaneous inoculation with portions of gangrenous pulps produced comparatively severe symptoms in 36.8 per cent. of the pulps experimented with; slight effects in 47.4 per cent., and no apparent reaction in 15.8 per cent.

It appears from these results that inoculation with portions of gangrenous pulps is more dangerous than inoculation with pure cultures from the same pulps, which is as we should naturally expect it to be. I intend, however, later to discuss the question of the bacteria of foul pulps at length, and pass the subject here with this brief mention.

The mixed infections invariably resulted in the death of the animal.

During these studies I have found in the oral cavity a number of bacteria which possess more or less pathogenic action, four of which I have examined more in detail.

The first of these, *Micrococcus gingivae pyogenus*, was found in a case of pyorrhea alveolaris three times in the same month, at intervals of three months; also in a very filthy mouth, in the deposit around the teeth. It appears as irregular cocci, or very plump rods, singly or in pairs. In gelatine-plate cultures it grows rapidly at room temperature, forming round colonies, with a distinctly sharp margin. At first the colonies appear very slightly colored under the microscope, and as they become older they grow very dark, especially where they lie far apart. Lane cultures on Agar-Agar pro-

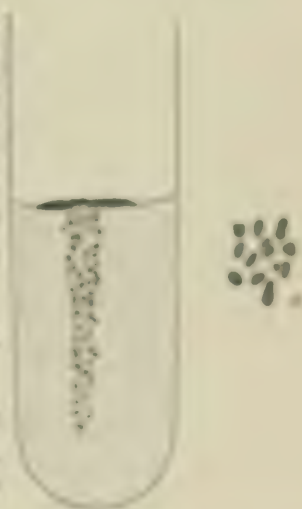


Fig. 1

sent a moderately thick, greyish growth, having a tinge of purple by transmitted light. Under the microscope they appear as a homogeneous, nearly colorless matrix, interspersed with darker figures of various irregular shapes.



Fig. 2

Puncture (*stich*) cultures in gelatine have, when eight days old, the appearance seen at *a*, fig. 1. The gelatine does not become liquefied. Cultures in beef-extract-peptone-sugar-solutions show a strong acid reaction and develop considerable quantities of gas. Subcutaneous inoculations of mice were followed by abscess and necrosis of the skin, occasionally resulting in the death of the animal. Injections in the abdominal cavity invariably produced the death of the animal in twelve to twenty-four hours, the section revealing immense numbers of bacteria in the abdominal cavity, a considerable quantity of a serous exudation, peritonitis, etc. Only a very limited number of larger animals—two rabbits and two guinea-pigs—have been inoculated. The animals appeared sick for a time, sitting quietly in the corner of the cage and refusing to eat. After two or three days, however, all symptoms disappeared.

The second, *Bacterium gingivæ pyogenes*, was found in the same mouth with the micro-organisms just described, and also in a suppurating tooth-pulp. It appears in form of thick, short bacteria with rounded ends, one and a half to four times as long as thick, (see fig. 2, *a*.) In plate cultures it grows very rapidly, even at room temperature, the colonies being clearly visible to the naked eye in twenty-four hours. Under the microscope they appear as beautiful, perfectly



Fig. 3

round, yellowish colonies, with a sharp, dark border. The gelatine becomes rapidly liquefied, so that in forty-eight hours the first dilution is completely melted.

Line cultures on gelatine appear in fifteen hours as a trough of melted gelatine one and a half mm. broad, the side of the trough

being cloudy and the bottom marked by a line of white sediment.

Line cultures in Agar-Agar present a thick, moist, slightly greyish growth by transmitted light, having a slight greenish yellow tinge under the microscope, colorless at the margin, yellowish brown towards the middle, and presenting a fibrillated structure.

Puncture cultures in gelatine, eight days old, have the appearance seen in fig. 2. The gelatine rapidly melts in form of a filament, while the masses of bacteria sink to the bottom, the melted gelatine, however, remaining cloudy.

Injection of this fungus into the abdominal cavity of white mice produced death in ten to twenty-five hours. During their sickness the mice sit drawn up, with bent back and eyelids glued together. The section showed peritonitis, and in some cases purulent exudation. Micro-organisms were found only in very few numbers in the blood.

Injection of 0.25 into the abdominal cavity of rabbits and guinea-pigs produced identical results. Injection into the lung produced death in less than twenty-four hours. Subcutaneous inoculation (injections) of mice, resulted in extensive abscess formation.

The third bacterium, which I have named *Bacillus dentalis viridans*, was found in the superficial layers of carious dentine. It appears as slightly curved, pointed rods, single or in pairs (fig. 3, a). It grows well in plate cultures at room temperature; the colonies under the microscope are nearly colorless,

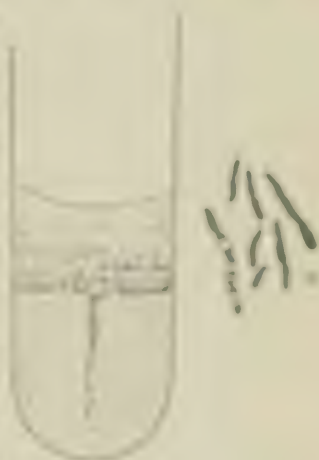


Fig. 1.

having but a slight yellow tinge; they are perfectly round, with a sharp contour, and show, when they do not lie too close together, two or three concentric rings. This bacterium is characterized by the production of a beautiful opalescent green coloring matter, which it imparts to the gelatine; the cell itself is not colored.

Line cultures on Agar-Agar produce a very thin growth, with irregular margins, bluish by transmitted light, greenish grey by reflected light, and colorless under the microscope.

Puncture cultures on gelatine, eight days old, present the form seen in fig. 3.

Subcutaneous applications from pure cultures of this bacterium produced severe local inflammation and suppuration, and in one case death by blood poisoning, the bacteria being found in large numbers in the blood and tissues.

Injections into the abdominal cavity of white mice and guinea-pigs, produced death in sixty per cent. of the cases, in twenty-two hours to six days, from peritonitis. Bacteria could not be found in the blood microscopically, but cultures made from the blood of the heart developed pure cultures of the bacterium injected.

The fourth micro-organism with pronounced pathogenic action, *Bacillus pulpæ pyogenes*, was found in a gangrenous tooth-pulp. It occurs as bacilli, often slightly curved and pointed, either singly, in pairs or in chains of four to eight (fig. 4, *a.*) It grows moderately well in gelatine-plate cultures, the colonies appearing large and round, dark yellowish brown, with distinct margin.

Line cultures on gelatine begin to melt in eighteen to twenty-four hours, up to that time appearing as greyish, shining lines, slightly elevated above the surface of the gelatine and about one mm. wide.

Line cultures on Agar-Agar produce a moderately extensive growth, bluish white, glistening by transmitted light, grey by reflected light; under the microscope, granular, sometimes fibrillar in structure, grey, or in older colonies, yellowish.

Puncture cultures in gelatine, eight days old, present the appearance seen in fig. 4. It melts the gelatine with about equal rapidity on the sides and in the middle of the tube. Injections of 0.05 into the abdominal cavity proved fatal to mice in eighteen to thirty hours.

(TO BE CONTINUED.)

CONTRIBUTIONS TO THE HISTORY OF DEVELOPMENT
OF THE TEETH.

BY CARL HEITZMANN, M. D., AND C. F. W. BÖDECKER, D. D. S., M. D. S.

CONCLUDED FROM PAGE 289.

Dr. J. L. Williams (*Dental Cosmos*, Vol. XXVI, page 193) says, "I have examined many specimens mounted in dilute glycerine, in which the elements of the enamel organ and those of the dentinal germ were in juxtaposition, but without discovering this structure-

less, transparent membrane. * * * My own observations lead me to believe that these stellate elements are the result of a direct modification of the primitive polygonal elements, and must, therefore, be regarded as strictly epithelial in their nature. + + +

Preceding the development of the ameloblasts, or enamel formers, the original prismatic cells break up or divide into round, nucleated corpuscles. * * *

From these embryonal corpuscles are developed the enamel forming cells. * * * The material for the formation of the enamel comes through the enamel organ. * * *

I announced * * * that the enamel organ was a true secreting organ. * * *

So far as appearance teaches us anything, it seems as though the ameloblasts were the active agents in depositing the lime-salts on the periphery of the dentine, and that they gradually recede with the progressive formation of the enamel. *

* * My studies of pulp tissue have led to the discovery that the odontoblasts are probably of the nature of multipolar ganglion cells. * * *

The odontoblasts, while composed of what is essentially neural matter, are probably at the same time the active elementary agents in secreting the material for the formation and continued integrity of the dentine. * * * The ameloblasts finally become almost obliterated * * * and are probably calcified to form Nasmyth's membrane. * * *

W. X. Sudduth (*American Syst. of Dentistry*, Philadelphia, 1886, page 518) is of the opinion that during the process of amelification there is no conversion of living tissue into enamel, but that the latter, as well as the dentine, is produced by a process of excretion. "The striae of Retzius are produced by inequalities upon the surface of the enamel prisms." * * * Nasmyth's membrane arises by a metamorphosis of the ameloblastic layer. * * * The breaking up of the enamel organ, as such, over the apex of the forming tooth is a constant accompaniment of the beginning of calcification." The author also describes the nests and teeth which arise from the remnants of the external epithelium and the cord of the enamel organ. Sudduth further says concerning the formation of the enamel: "The first change noted is seen over the apex of the papilla. The protoplasm begins to break up into columns, which stand at right angles to the side of the papilla; each column contains a nucleus. * * * The development of the dentine always precedes the formation of enamel. The disappearance of the

outer tunic occurs about the same time as the beginning of the calcification of the first layer of the enamel, the salts of calcium which are stored up in the meshes of the stellate reticulum only sufficing to furnish material for the very first formed layer of enamel. With the disappearance of the outer tunic and the stellate reticulum as such, the ameloblasts come in direct communication with the rich plexus of capillary vessels, the latter furnishing the lime-salts for the completion of the calcification of the enamel." In regard to the cells of the stratum intermedium, this writer says: "Just what their signification is I am unable to state positively, but from my studies in comparative embryology, I am led to believe that they supply the places made by the increase in the circumference of the enamel, and account for the short prisms seen in ground sections of enamel. * * * The line of ameloblasts that are first formed does not represent the same number of ameloblasts that will finally complete the process of calcification. The outer circumference of the developed enamel is many times larger than that of the first calcified layer. * * * The office of the spheroidal cells in this instance is to develop ameloblasts to supply the places of those which are carried up with the growing tooth. * * * The final calcification in thickness is accomplished after the atrophy of the enamel organ has occurred. It is absolutely essential that the capillary vessels should come in contact with the enamel cells before the process of calcification can be completed. * * * In the development of bone the osteoblasts do not become calcified, but the lime-salts are deposited around the spherical osteoblasts in the form of spherules, increasing in thickness from within outward, and thus approaching one another, they coalesce. The osteoblasts persist as the organic contents of the lacunæ. * * * In the calcification of dentine the odontoblasts do not become directly calcified, but send out rod-shaped fibrils, around which tubular dentine is formed; so also in the enamel we have the prismatic ameloblasts superintending the deposit of prismatic enamel. * * * Tomes processes, I consider as mechanically made."

Otto Walkhoff (*Deutsche Monatsschr. f. Zahnheilkunde*, 1887, pages 246 and 304), after giving a good description of the literature on our subject, describes the development as follows: "The basis-substance of the dentine is produced by a transformation of the odontoblasts, as stated by Waldeyer, which is accomplished in such

a manner that the cell contents of the periphery of the odontoblast is changed into a homogeneous substance, which is pushed by the dentinal fibers and their transverse offshoots, which latter are formed by the lengthening of the nucleus of the odontoblast." *

* * From my observations I have come to the conclusion that the basis-substance is formed in an unbroken contiguity by the pulp cells after forming odontoblasts, without leaving a trace between the single cells, as long as the formation of the dentine is continuous. In later periods of life, however, when the formation of dentine is slow, we observe the contours of the transformed odontoblasts.

L. A. Weil (Deutsche Monatsschr. f. Zahnheilkunde, 1887, page 81, and 1888, page 19), in describing the anatomy of the pulp, states that the zone of dentine which has been calcified last is made up of globular masses. He also observed the structureless zone which is present between the odontoblasts and the newly formed dentine. He further says that the globular arrangement of the dentine can only be observed in newly formed tissue, while the dentine of adult teeth is regular. This author also states that from a morphological point of view the odontoblasts are identical with the ameloblasts, from which the former cannot be distinguished.

The writer regret to state that they have been unable to obtain all the publications on this subject. Among the works among are the following ones of HANCOCK, CHICAGO, ILL.

RESECTION OF THE SUPERIOR MAXILLA FOR SARCOMA.

READ BEFORE A UNION MEETING OF THE SEVENTH AND EIGHTH DISTRICT DENTAL SOCIETIES OF THE STATE OF NEW YORK, HELD AT BUFFALO,
OCTOBER 25 AND 26, 1887.

BY HERMAN MYSTER, M. D., SURGEON TO THE BUFFALO GENERAL HOSPITAL.

Mr. President and Gentlemen:—

I have asked the privilege of bringing a patient before your association to-night, because he suffered from a disease for which one would naturally, at the outset, consult members of your profession, and because the disease, if recognized early, offers rational

favorable prognosis, while if overlooked or neglected in its incipency it will require a formidable operation, and even then, in a majority of cases, will relapse and progress to a fatal termination, with great sufferings.

The patient is a German, sixty-one years of age, who was admitted to the General Hospital, June 14th, 1887. He has a good family record, and has always enjoyed good health. Ten years ago he was much troubled with a bad tooth in the right upper maxilla. After a time it was extracted, but a piece of the root was left, which troubled him more or less. Ten months ago he first noticed a swelling in that locality, which steadily increased in size, but without being particularly painful. He consulted a dentist six weeks previous to his entrance into the hospital, who extracted a piece of a root, and after that the swelling grew rapidly. During the last weeks before entering the hospital, he had severe shooting pains and much tenderness of the growth. He lost his appetite, swallowed with difficulty, and was considerably emaciated. By local inspection, a large tumor was seen to occupy the whole posterior half of the right superior maxilla, extending from the first bicuspid backward. The whole superior maxilla was uniformly enlarged and protruding; all the molar teeth were lacking, and their place and the hard palate occupied by a large, soft, fringed and granulating tumor, as large as an egg, which filled the whole right side of the mouth, emitting a very bad odor. Backwards it was easily circumscribed with the finger, and neither the soft palate nor the anterior pillars of the pharynx seemed to be involved. No secondary affection of the glands of the neck was discovered.

June 15th—Operation under ether. Tracheotomy was first performed, and a large silver canula introduced, through which the narcosis was continued. A large sponge, attached to a strong silk thread, was then introduced into the pharynx, to prevent entrance of blood into the larynx. The whole right superior maxilla was then removed, after Ferguson's method. An incision was made from the inner angle of the eye to the outer limit of the orbit, parallel with and a little below the infraorbital ridge, as described in Agnew's Surgery, and another, commencing at the nasal extremity of the first, was carried down along the side of the nose around its ala to the columna nasi, and from there through the middle of the upper lip. The whole flap was then dissected up close to the bone,

and the bleeding stopped by pressure with the fingers and a few ligatures. The periosteum at the floor of the orbit was then detached, a chain-saw introduced through the inferior *fissura orbitalis* and the malar bone, or zygoma, cut through. The *processus frontalis* of the superior maxilla was then severed with the chisel, and lastly the *processus palatinus* cut through with a straight narrow saw, introduced through the nose. The superior maxilla, thus loosened from its bony connections, was then seized with a strong pair of lion forceps, dislodged from its bed and drawn downwards, by which proceeding its attachment to the pterygoid process of the sphenoid was broken. Lastly, the soft palate was severed with the thermocautery. After the moderate hemorrhage was stopped, partly with ligatures, partly with the thermocautery, the wound was sutured with a great number of catgut sutures, and the large cavity filled with iodoform gauze.

June 16th—The patient has rallied well and takes nourishment. The tracheal canula was removed.

June 20th—The gauze packing was removed. Some sloughing of superficial tissue was observed, due to the thermocautery.

June 23d—The wound in the trachea is closed; the patient is sitting up, and the wound has united by first intention.

June 25th—Patient discharged, with the large cavity granulating and rapidly filling up.

By microscopical examination the tumor was found to be a round-celled sarcoma. Since the operation four months have passed, and no symptom of relapse has so far presented itself. We may therefore fairly consider him cured, although there is, of course, a possibility of future relapse. He feels perfectly well, is able to work, but swallows with some difficulty on account of the large opening in the hard palate, and his voice has a very pronounced nasal sound, so much so that it is difficult to understand him. For that reason, Dr. Barrett has made him a prosthesis of hard rubber, attached to the teeth of the left superior maxilla, by the aid of which his speech, as you will observe, is very much improved and the swallowing easier. A cicatricial contraction of the maxillary membrane, the result of the application of the thermocautery, by which he is prevented in opening his mouth widely, has given Dr. Barrett considerable difficulty in taking the impression. The contracted bands might, of course, be cut through without difficulty. The deformity,

as you will observe, is very slight, on account of the dense connective tissue which fills out the void.

Our knowledge of tumors of the upper jaw has been modified by modern histological and microscopical investigations. I shall not here enter deeply into this subject, but only briefly state that tumors of the jaw may be either non-malignant, as fibromata, osteomata and enchondromata, or malignant, as sarcomata and carcinomata, with their subdivisions, scirrhus, medullary cancer and epithelioma. The non-malignant tumors take their origin either in the periosteum or the endosteum, may grow to an enormous size, but are not dangerous to life except by their size and complications arising from it; nor do they relapse after extirpation. Under the name sarcoma is understood tumors composed of tissue which is either embryonic, or which is undergoing one of the primary modifications seen in the development of adult connective tissue (Ericksen). We distinguish different forms of sarcoma as spindle-celled, round-celled, fibrosarcoma, chondro-sarcoma, osteo-sarcoma, etc. We may, in general, say that the richer they are in cells, the more apt are they to relapse after extirpation; the more connective tissue they contain, the less malignant. Free removal is necessary on account of their tendency to extend along the periosteum beyond the defined tumor.

The carcinomata are tumors of epithelial origin, and generally of alveolar structure. They infiltrate the affected part, producing induration and ulceration, with secondary affections of the lymphatic glands and the internal organs. Carcinomata generally attack people in middle life or old age, men twice as often as women. As regards the frequency of the different forms of tumors, no great reliance can be placed on the older statistics, gathered together before microscopical examinations of the extirpated tumors had become the rule. Dr. Ohleman (*Arkiv fuer Klinische Chirurgie*, 1875) reports thirty-two cases of total excision, of which nineteen were carcinomata, twelve sarcomata and one an echondroma. It shows the carcinomatous growths to be the most frequent, and in this agrees with other statistics. When we consider the question of the percentage of cures after the operation, there is more disagreement among the authors.

Ashhurst mentions eighty-four cases, of which fifty-one recovered and thirty-three died or relapsed, being sixty-one per cent. of recov-

eries. Agnew gives a table of one hundred and seventy-nine complete excisions, of which eighty recovered, being forty-seven per cent. of recoveries.

Ohleman (*Archiv. fuer Klinische Chirurgie*, 1875) mentions thirty-two cases. Of these twenty were total excisions, with seventeen recoveries and three deaths, or eighty-five per cent. of recoveries, but relapse occurred in all cases, some earlier, some later (some in three years), and in no case was the cure permanent.

Braun (*Centralblatt fuer Chirurgie*, 1876) reports eleven cases, of which seven recovered and four died, but of the seven recoveries five had relapses, and died later, so that only two were permanently cured, being eighteen per cent.

Estlander (in *Nordisk Medicinsk Archiv*.) gives reliable but small statistics of twenty cases, which he followed to the end. Of these fifteen were men, five women, and the ages ranged from twenty-seven to sixty-nine. Operation was impossible in four, and four others died after the operation, of intercurrent diseases. Of the twelve left, two were finally cured, being seventeen per cent., while the rest died of relapse. You see, then, there is a great difference of opinion, some giving eighty-five per cent. of recoveries, others only seventeen per cent., yet the statistics from smaller countries are apt to be more reliable, as the cases generally may be followed to the end.

Estlander draws some conclusions from his statistics, which are interesting. The average duration is generally about one year, the progress being a little more rapid with younger patients than with older ones. The patients generally present themselves to the surgeon just midway between the first appearance of the tumor and the final fatal termination, so that the patient will live just about as long after the consultation as he has had the tumor before the consultation, and that, whether he be operated upon or not (cure not counted). Thus, if a patient has suffered six months before the consultation, he will probably live six months more; if he presents himself sooner (because the disease has made more rapid progress), he will die correspondingly sooner, but his sufferings will be mitigated and death made easier by the operation.

A patient with sarcoma would, according to this, ordinarily live one year. During the first six months the sufferings are not very acute, and he would therefore not apply for surgical aid. If not

operated upon he would still have six months to live. The same would be the case if a relapse occurred after an operation. If he submits to an operation, his chances of a permanent cure are equal to one out of six. Secondarily, he has a chance of prolonging his life twice as long, but the probability that he will neither gain nor lose anything, as far as time is concerned, is four to one. He is only sure that the last months of his life will be more endurable if he be not cured. In partial excisions, the percentage of cures is much greater, while it is slightly worse in total excision of both superior maxillæ. The earlier the operation is performed, the greater is the probability of complete cure, and for that reason it is of the greatest importance to the patient that the disease be recognized early, when the tumor is yet small, and may require only a partial instead of a total excision. In regard to etiology, very little is known. Dr. Ohleman states that in some cases heredity was evident, in others an injury. In most cases no cause can be given, and it is impossible to decide whether a trauma gives the occasion to the abnormal development of the cells, or only favors it by the irritation it produces. The pain is generally ascribed to the teeth, and as they become loose they are extracted. In the course of six months the patients generally present themselves with a tumor as big as an egg, but otherwise in good condition, and without secondary affections of the glands. The differential diagnosis is not difficult. The slow and painless development of the tumor, its appearance, the uniform enlargement, the loosening of the teeth and the extension along the gum, are sufficient to distinguish the trouble from periostitis, with its severe pain, increased generally by pressure on one tooth, its inflammatory symptoms and its hard, painful swelling of the bone itself. Abscess of the Antrum of Highmore presents more symptoms of inflammation, the etiology is better known and the dry parchment sensation is characteristic. An exploratory puncture will reveal pus. Lastly, a microscopical examination of a small piece of the tumor will guard against mistakes.

A few points deserve mention in regard to the operation itself. The greatest danger is the hemorrhage, and the entrance of blood into the larynx and lungs. That the patients in some measure might voluntarily expectorate the blood, the operation was formerly often performed without narcosis, or with only partial narcosis during the beginning of the operation. Even if this in some

measure relieves the danger of entrance of blood into the larynx, it lengthens the operation considerably by the violent struggles of the patient, and the whole performance is horrible beyond expression. We have two other ways of overcoming the difficulty, either preliminary tracheotomy, as in my case, or Roser's method of operating with declined head. Roser's method is liable to the objection that it increases the bleeding and is apt to produce acute anemia. Max Müller mentions such a case (*Archiv. fuer Klinische Chirurgie*, 1875), and states that he never saw such a bleeding in twelve previous cases in which Roser's method was not used. By preliminary tracheotomy we avoid this danger, and the narcosis can with the greatest ease be maintained through the tube. A Trendelenburg's canula is not necessary at all, as the pharynx can be blocked with a sponge to which a string is attached, that the sponge may not be swallowed, and not a drop of blood can enter the larynx. But tracheotomy has one disadvantage; it produces paresis of the vocal chords, and therefore it may be necessary to feed the patient for some days, either per rectum or with a stomach tube, to prevent the food from entering the lungs, which may be followed by pneumonia.

I will mention one improvement in the operation, described by Létievant. He conserves the infraorbital nerve, and by that the contractility of the muscles of the face, he says, by chiseling open the canal and taking the nerve out. The statement about conserving the contractility of the muscles of the face is, of course, a mistake, as the infraorbital nerve is not a motor nerve. Yet his operation has the advantage that it leaves on both sides of the nerve a part of the bony margin of the orbit, and a part of the alveolar process with the incisor teeth. These three points prevent the sinking in of the flap and give it a good support.

At the present moment, one year after the operation, the patient is enjoying excellent health, and absolutely no signs of relapse have occurred. The nerve has still further contracted, and, the nasal bone exposed, gives him no trouble. The cicatricial contraction of the mucous membrane has increased some, and prevents him in opening the mouth far enough to have the prosthesis inserted. It would be quite difficult to overcome this contraction now. Enlargement of the contracted bands would have no effect, as the bands probably are very much shortened too, but there is really no indication for interfering with it, as he is able to open the mouth sufficient to coarsitate his food.

Reports of Society Meetings.

ILLINOIS STATE DENTAL SOCIETY.

TWENTY-FOURTH ANNUAL MEETING.

REPORTED FOR THE INDEPENDENT PRACTITIONER.

BY C. N. JOHNSON, L. D. S., D. D. S.

CONTINUED FROM PAGE 319.

WEDNESDAY EVENING.

A special order for the evening was the description, by Dr. C. C. Carroll, Meadville, Pa., of his method of casting aluminum plates. Briefly, it was as follows: The principal objections, heretofore, to the use of aluminum for artificial dentures were that it could not be successfully soldered, and that when used in connection with rubber it would disintegrate. Efforts were then made to cast aluminum, but a difficulty arose in the fact that it would not pour well into interstices, and thus failed to make a sharp cast. This was overcome by the application of pneumatic pressure, so exerted as to force it into the impression; but then it was found that it would contract. These difficulties have all been remedied. The disintegration was due to impurities (principally of iron), as aluminum has a great affinity for other metals, and was overcome by care in purifying. The contraction was rectified by alloying it with some metal which expands at the same time that the aluminum contracts. The metals now used in combination with aluminum to obtain the best results in every respect are platinum, silver and copper.

In making a denture with aluminum, first obtain a perfect impression. Then make a model of plaster of Paris and marble dust. For a full set, with rubber attachment, adapt base-plate wax to the model exactly as you wish the aluminum plate to be. Make the plate thin, as the metal is strong. Then invest in a two-part flask made for the purpose, much the same as for a rubber piece. After

taking it apart to remove the wax, cut grooves from the front and back part of the plate to the outside of the flask. Then lock the flask together again and dry it out. At the same time have the metal heating, and when the cast is dry and the aluminum melted, force the metal into the cast by pneumatic pressure, applied with a rubber bulb. When it is cool, trim the plate and attach the teeth with rubber or celluloid.

When the teeth are to be attached to the aluminum itself, mould the teeth in the flask with the base wax and proceed as before. In fastening teeth in this manner, they should be set slightly apart, on account of a little contraction in the metal.

Dr. Louis Ottofy then read a paper on "Operative Dentistry." Only a partial review of the most important branches of the subject, he said, was possible in the paper. The precious value of time is a matter of consideration for the dentist, even though he may not have an extensive practice. Study each case with a special view to decreasing the amount of labor and shortening the time to the lowest minimum consistent with good work. The practice of inserting extraordinarily large contour fillings is superseded by porcelain settings, or entire porcelain crowns. The former class of work appears to offer, in many cases, service and beauty. Crowns for the anterior teeth are made as simple as possible, with little gold visible. The Logan crown, with improved pin, is, in many cases, the best substitute. They should be ground as little as possible, especially on the palatine or lingual surface, to prevent fracture. Usually the root should be circled by a properly adjusted gold band previous to fitting the crown. The joint is then between the gold band and artificial tooth, and much loss of the oxyphosphate must take place before the root is exposed. For posterior teeth the all-gold crowns are best, and Dr. Patrick's device for making them is worthy of commendation. Those not provided with a proper machine will find the seamless bands and solid gold cusps convenient. Where the occluding teeth are artificial, they may be ground so as to conform to the masticating surface of the crown, but where they are natural, the crown should be shaped with minute care, so as to make it articulate properly with the natural ones. Crowns are preferable to large, unsightly gold fillings for anterior teeth.

The writer has learned nothing new as to the use of gold for filling since last year. Much better and more persistent operations

can be made with non-cohesive than with cohesive gold, though the most exposed portion of the filling should be covered with the latter. Margins of cavities are often injured by the pressure necessary to condense cohesive gold, as also by the idea that the cavity must be plugged as tight as possible. Small cavities should be filled entirely with non-cohesive gold, usually by hand pressure. The combination of tin and gold has been tested sufficiently to prove that it has a legitimate place in dentistry. When cavities extend beyond the gum margin to points where it is difficult to insert a filling, this material is especially applicable. It can be finished with burnishers if disks or strips will not reach it. Any discoloration is confined to the material itself. It is not advisable to use it for small fissures in molars and bicusps, because gold alone can be used to better advantage, and in buccal cavities of molars copper amalgam is preferable. The latter can be introduced more readily, and moisture will not affect it.

Amalgams in general are used more carefully than formerly, and for this reason yield better results. The same attention should be given to the insertion and finishing of an amalgam as to a gold filling, though many of our prominent operators neglect this. The filling should be finished at a subsequent sitting. Copper amalgam is coming into use, and is certainly a good preservative. The principal objection to its use, outside of its discoloration, is that where other metals are inserted in the same mouth patients have complained of a metallic taste, especially when sour food is taken. In one case this was very marked, and the patient spoke of a coppery taste, though not informed that copper had been used. The best use for copper amalgam is in molars, where the cavity extends far below the gum.

The oxyphosphates and gutta-percha are still useful for temporary work. Oxychloride is never used, except when not exposed to the fluids of the mouth. An oxyphosphate will last longer in a mouth, when the saliva is scanty and neutral, than where it is acid or alkaline and viscid.

There is one point in connection with pulpless teeth that deserves attention. Where the tooth has been filled, and from any cause abscess occurs, never resort to the abominable practice of drilling a vent-hole to relieve it. In treating abscesses the use of strong drugs, which, besides destroying the diseased portion, also destroy

healthy tissue, should be avoided. One good, thorough application of a suitable drug once a week will yield better results than treating too frequently.

An endeavor should be made to save living pulps in all cases presented under fourteen years. As age advances the chances decrease. Pulp may be dusted with iodoform previous to capping.

The use of matrices in filling saves time and makes it possible to perform better operations. Revolving instruments in the engine enable the operator to work more rapidly, and cause less pain to the patient than the slow-cutting hand instruments.

DISCUSSION.

Dr. J. W. Wassall—This is a comprehensive subject. The lecturer has necessarily omitted many important points. The suggestion as to the saving of time is a good one. Time is precious to both patient and operator, though the work should not be hurried so fast as to slight it. In filling we should study well to contour our work just to the extent required. There is danger of going to the one extreme of contouring too much, and to the other of not contouring enough. It is also sometimes a nice point to decide between large fillings and crown work. I would prefer, in young patients, to fill, even though it was necessary to contour, and though the filling might last only five or six years. The crown will come soon enough. I am inclined to doubt that the Logan crown is best for anterior teeth. To my mind the regular gold and porcelain crown is preferable to any other for these teeth, and for the posterior teeth the all-gold crown is best.

In regard to bridge-work, I have inserted it in three cases, where it has been found eminently satisfactory, and there is probably a field for it in certain instances, though it is well to sound a note of warning against a too frequent application of the method. The subject of gold is an important one, and should be well discussed. It is the material that we use most in practice. The general rule is to use non-cohesive gold at the cervical margin and along the walls of the cavity, finishing the filling with cohesive. The use of tin and gold dates back forty years, and none can doubt the utility of this material. Soft gold cylinders rolled tight will pack down dense and hard, and may be used to advantage with the matrix. The heavier foils should be used more than they are in finishing fillings. No. 120 will be found very useful for this purpose.

In the use of amalgam I should like to emphasize the fact that the polishing should be done at a subsequent sitting. You will then see the defects if there are any, and can remedy them. Copper amalgam is the latest amalgam hobby in America, and it is possessed of practical value. It is gratifying to look at a good filling of this material in the buccal surface of a third molar.

In the use of cements, there are two secrets of the greatest possible importance. First, use just the exact amount to fill the cavity, so that it will not need trimming. In this way you get the outside gloss of the filling by burnishing, and it leaves a more vitreous surface, which will withstand the action of the saliva better than if cut down. Second, give more time in setting. I usually leave the rubber on an hour after the filling is inserted. If I have other fillings to put in, I tie the rubber around the tooth filled with cement, and proceed with the other work, so that it may be kept dry and set while I am working. If there is no other work to do in the same mouth, I simply tell the patient it is necessary to wait in the office with the rubber on till the filling is perfectly hard, and in the meantime I can work at another patient. Cement fillings treated in this way will last much longer than if inserted in the ordinary manner.

In regard to pulpless teeth with a fistulous opening, the general opinion seems to be that they are the simplest cases for immediate root filling. I must differ from this opinion. When they are filled at once there is sometimes a large chronic opening left at the end of the root, without the operator's knowledge, and the abscess will not heal so long as it is there. It is sometimes necessary, where the end of the root extends up into an opening of this kind, to enter the apical space at the end of the root and cut it off. Where there is a fistulous opening, it is always best to determine whether or not there is an enlarged space at the end of the root before filling. This can be done by passing a broach through the end. If there is sensitiveness when the broach reaches the point that you would judge to be the apex, then there is no cavity; but if it passes on and on, beyond what you must know to be the end of the root, then you may be sure there is a cavity.

It is more necessary to endeavor to save pulps by capping during the formative stage of the tooth than afterward. The process of calcification is not quite complete till adult life, and in patients un-

der twenty it is advisable to make the effort with almost any kind of exposure.

I get a great deal of satisfaction from the use of matrices and separators. For wedging teeth, waxed tape is the most useful material we have. You can procure it in all sizes, and may then saturate it in yellow wax. All teeth will yield slightly when pressed apart, and this material wedges them from the pressure exerted when placed between them, and not from subsequent swelling.

Dr. Taylor—Speaking of gutta-percha, we may have a case where the dentist has drilled through the bifurcation of the roots, and by thoroughly drying and filling with gutta-percha we will find that the tissues receive it kindly in these cases. It is also useful for capping nearly exposed pulps, being a better non-conductor and non-irritant than the cements. Another use for it is in deep buccal cavities. Cements sometimes are not thoroughly mixed. Do not burnish an oxyphosphate so as to disturb it while crystallizing, but bring steady pressure to bear upon it.

Dr. J. N. Crouse—I have been called upon to speak from the standpoint of how we should treat patients when they come to us for our services. The most important thing is the diagnosis. Not simply to find out how many fillings we have to insert, but how badly the teeth are decayed, and to decide whether the failure is due to neglect on the part of the patient or not. There are several points to be considered when we proceed to put a mouth in order. Our first duty is to instruct the patient as to the proper care of the teeth; especially is this true in the case of children. Then we should consider the pocket-book, so as to judge what class of operations to perform. Not that we should ever do slovenly work, but in cases where the patient cannot afford to pay for expensive work, it may be advisable to use some of the temporary plastics to keep the teeth comfortable and safe till the patient can afford to have more permanent operations performed.

In beginning work for a new patient, take an easy operation at first, till you see what kind of a patient he is going to be, whether he will follow instructions as to cleaning the teeth, and will appreciate good work or not. When patients tell you that fillings are always falling in their teeth, it is more than likely that they themselves are to blame for it. Show your patient the deposits around the teeth and make him appreciate the importance of proper brush-

ing. Tell him what form of tooth-brush to use, and advocate the use of tooth-picks. It should not be considered vulgar, even for ladies, to pick the teeth. Also instruct the patient in the use of floss silk. At the next sitting see what effect your advice has had on the patient. If the teeth are well cleaned and give evidence of close attention, then you may be encouraged to go on and insert good, permanent fillings; but if your instructions have not been followed in any particular, it is well to plainly state to the patient the utter uselessness of placing expensive work in a mouth where so little care is taken of the teeth. The necessity for this kind of instruction holds true, more particularly with children. Get them aroused to the importance of brushing the teeth. I had a boy in the chair one day who told me point blank that he would not brush his teeth. I immediately dismissed him, and sent him home with the remark that I would never work for a boy who refused to take care of his teeth. He appeared quite crestfallen when he saw I was in earnest, and went out of the office reluctantly. I then telephoned his mother what I had done, and told her to give it to him at the other end of the line when he reached home. He came back in a few days with his teeth clean, and to-day I have not a patient who takes more faithful care of the teeth than that boy. This demonstrates the necessity for sharp measures in some instances.

If a patient comes to you with a lot of spaces between the teeth, made by the Arthur method of separating, it is your duty to contour those teeth so that the patient may chew without forcing the food down against the gums and making them sensitive. That is, if the patient will take care of the teeth afterward; if not, it is better to leave the spaces. There is one class of teeth in which separations are especially injurious, namely, those with small necks. A space between these teeth always leaves a pocket at the neck, and food will lodge between the teeth, so that any effort to eat a proper kind of food will result in discomfort. In these cases the patient usually resorts to soaked bread and other soft foods which require little mastication, and which are less beneficial than the solid foods requiring force to masticate them. In contouring these cases the separators come into use. The Parr and Perry separators are both good, but the former is probably the better. The process of wedging is lessened by the use of these appliances, but they must always be used cautiously. It is easier to finish a contour filling now than

formerly. We can use disks in the engine, and by directing them with an instrument, may give them any curve we wish. It requires much energy on the part of both operator and patient to go through these operations, but when well performed they will repay it.

In regard to filling materials, if the patient is careless and you cannot arouse him to care of the teeth, it matters little what you fill with, decay will likely recur. Cleanliness is the most important thing for the dentist to attend to. I have used tin and gold in the past, but do not use it so much now. I have had failures through a disintegration of the tin into a powder. I think I can fill nearly as quickly with soft gold cylinders, which I make myself. I roll some tight and others loose, and use the different forms as required. Wedge them in and lap them over the edge of the cavity. Never try to condense the first cylinder thoroughly, but wedge the gold into place. I think there is more impure gold on the market than we suppose. I do not like velvet gold. My experience with it was that it rolled up hard before I could get it well into place against the walls of the cavity. If you want to use a cohesive gold take No. 10, and fold it till you get about eight thicknesses. You can work more rapidly with this than with the heavier foil, say No. 30. Good filling can be made with No. 60, but it takes too long.

Adjourned.

CLINICS AND NEW APPLIANCES.

Two mornings were devoted to this, Wednesday and Thursday.

Dr. T. W. Brophy filled a right upper bicuspid, proximal cavity, demonstrating his loop matrix. Dr. Brophy has made a change in his matrix, whereby one screw can be used with any number of bands, thus lessening the expense.

Dr. J. W. Cormany filled a right central incisor, mesial surface, making a large contour filling with the electric mallet.

Dr. D. B. Freeman demonstrated his various forms of matrices and appliances.

Dr. C. P. Pruyn extracted several teeth after injecting cocaine in the gums as a local anæsthetic. In some of the cases the agent seemed to work favorably, but in one instance the drug produced marked general effects, which necessitated the use of restoratives. Dr. Pruyn stated that this result seldom occurred, but that this case proved the advisability of always being on the alert for such developments.

Dr. C. A. Kitchen inserted a large compound filling in a lower molar, using tin for the cervical margin and bottom of the cavity, and completing with gold.

Dr. W. N. Morrison demonstrated various regulating appliances, among which was the jack screw secured by thin platinum bands. He also replanted a molar that had been extracted in the clinic.

Dr. T. L. Gilmer placed a gold and platinum crown on a lower bicuspid, using the telescope method. A vent-hole was drilled in the grinding surface, and when the crown was in place a small gold wire was driven into the hole and then finished down smooth with the surface of the crown. This does away with the necessity of inserting a gold filling in the vent hole.

Dr. W. H. Taggart exhibited his corundum point and disk maker. This instrument should be in the hands of every dentist who uses corundum points.

Dr. J. G. Reid inserted a tin and gold filling, and Drs. E. D. Swain and K. B. Davis, each a gold filling.

Dr. J. J. R. Patrick demonstrated his method of regulating teeth by means of a large model with movable teeth. His improved appliances for this purpose are as well nigh perfect and as universal in application as it is possible to conceive. The same gentleman also placed a gold crown on a lower bicuspid.

Dr. A. W. Harlan gave a clinic on the treatment of pyorrhœa alveolaris, and exhibited the following new drugs: Ethylate of Sodium, used for destroying fungus growths, in place of chromic acid. It is self-limiting. Oil of Cade is the wood creosote from juniper wood. Iodide Trichloride, one of the newest and best disinfectants, on account of the ease with which it breaks up. It is loosely held together. Guaiaco, one of the principals obtained from wood creosote, to be used as an antiseptic. Benzol, for dissolving gutta-percha. It is more tenacious than the chloro-percha solution. Liquid Vaseline, used as a solvent for hydrochlorate of cocaine, and as a menstruum for antipyrine.

Dr. Fuller, of St. Louis, exhibited a compact case for holding burs and drills for the engine. It may be hung on the wall, and is very readily opened and closed.

A good electrical motor was exhibited by the Belding Motor Co., of Chicago. It is noiseless, simple and cheap.

Dr. H. W. Parsons, of Wamego, Kansas, presented his saliva-

ejector, warm air injector and atomizer. The working is all accomplished by electricity, and the description of the apparatus is given in a circular, to be had on application.

THURSDAY AFTERNOON.

Dr. Harlan moved that a committee be appointed for memorializing Congress to remove the duty from dental goods coming into this country. Carried.

Dr. W. B. Ames read a paper on "Amalgam." I do not propose, he said, to argue the claims of amalgam to recognition as a filling material. Were I eloquent I might expatiate on its virtues—virtues not born of the material itself, not of its nobility, high character or integrity, but most often of its susceptibility. I am a champion of the plastics. I do not entirely endorse the new departures, yet my conclusions amount to nearly the same as theirs. I would change the wording of their familiar tenet to read, "just in proportion to the difficulties in making fillings that will check and hold in abeyance tooth-destruction, is the use of gold contra-indicated." With this as an axiom, the first question, in a given case is, What is the quality of the tooth structure? Next, What is the nature of the difficulties to be overcome? With our available materials this question should be easily answered.

If we had a practical plastic gold it would aid us in the solution of the problem, but so far we have none that can be relied upon. The solution is in the material which combines easy manipulation with permanency. Have we in gold such a material? Only in certain cases—as in accessible cavities, where plain and easy operations are possible. In bad cavities, where the tooth material would be incompatible with gold (not necessarily electrically), some other material must be made use of. What will it be? In tin and gold we have a material allied to the plastics. Its adaptation to the tooth-wall is easy, and it is transformed into a homogeneous mass by what I consider primary and secondary galvanic action. But from its nature it is limited in its use, and the disadvantages of color is as marked as in any amalgam. Gutta-percha will not stand attrition, neither will tin foil. Cements may be used as adjuncts, but cannot be relied upon of themselves. Then does not an amalgam easy of manipulation, sufficiently dense, plastic during impaction, and which forms a mechanically perfect stopping, make an ideal

filling material, from a thoroughly practical point of view? Have we such an amalgam? From experiments I am satisfied we have.

The "New Departure" gave us many important points, and we have learned little since the publication, ten years ago, of Dr. J. Foster Flagg's work on "Plastics." His conclusions were, that in the heavily tinned amalgams we get bulging or spheroiding, and in the heavily silvered alloys, containing a per cent. of copper, we get very little change of form, even when carelessly manipulated. He put us in the way of judging the qualities of an amalgam from its manipulation.

Cadmium, antimony and zinc, I believe, are of little use in an amalgam. One effect of gold as an ingredient is to render the amalgam very dirty, although an amalgamation of pure gold with mercury will make a clean white substance.

In making tube-tests recently, the conclusions arrived at were, that a good moisture-tight filling can be made by a careful use of many of the higher grades of alloys, and that some of the lower grades may be used beneficially by a certain manner of working them that I have not seen mentioned. In heavily tinned amalgams, the form change is in proportion to the thorough amalgamation; that is, an amalgam just sufficiently mixed to admit of packing changes form less than one made homogeneous by long trituration. This observation strengthened with me a theory that silver and copper in an alloy controlled change of form by becoming only partially amalgamated. The solid particles remaining act as braces to prevent changes incidental to the plasticity of the tin. This theory also explains the crepitation or creaking of silver and copper amalgam. It also accounts for the excellency of copper amalgam.

In this combination of precipitated copper and mercury, I believe that the individuality of the molecules is not destroyed, and we have yet innumerable solid particles of copper with an amalgamated surface, the unamalgamated part acting as a brace against its neighbors to prevent the change of form which would take place in a homogeneous mass. This theory may be unscientific, but I believe that the entire question can be made to harmonize by studying the combining weights, specific gravity and chemical equivalents of the metals. I have not yet formulated my ideas sufficiently to offer them to any advantage.

Amalgamated platinum has not been well understood. I do not

refer to what are commonly called platinum alloys, but is amalgamated platinum—platinum and mercury combined. Authors have said that it is difficult of amalgamation, and that its effect in an amalgam is very questionable. Flagg places it last in desirability among the metals. Having produced it myself, I find it has good qualities which heretofore have not been attributed to it. Its only poor quality is that in some combinations it renders a clean amalgam somewhat dirty, and gives it a bad color at the edge. Of itself it remains indefinitely plastic, but when incorporated with other amalgams it generally imparts desirable qualities to the resulting mass, such as toughness and a somewhat leathery consistency. Mixed with sufficient gold to cause hardening, it gives a good amalgam, but one which, for some reason, has not a good surface color. An amalgam of palladium precipitated with platinum sets quickly, according to the amount of palladium. It gets hard and retains the color of pure palladium amalgam, which is a sort of gray, instead of black. With almost any alloy amalgam this material will impart its toughness, and, I think, hasten the setting. The mass becomes hard enough, and the color about the same as the alloy. I use pure copper amalgam in every-day work, and it is in combination with this that I have obtained the best results from platinum. I use it in all proportions. It hastens the setting so that the filling can be trimmed and burnished at the same operation. I sometimes face a copper amalgam with the platinum and copper mixture, thereby getting a good surface that does not turn so black in the mouth as pure copper amalgam.

Palladium amalgam, of itself, is not practicable, on account of its quick setting, but is of value in hardening the surface of other amalgams, and in hastening the setting of the mass. You may harden the surface of an ordinary amalgam filling by rubbing into it, after insertion, small quantities of precipitated palladium. The color is about like that of clean fractured steel or iron.

From very careful experimentation, I believe there is no evaporation of mercury from an amalgam filling, nor do we get any continued effects from chemical action.

DISCUSSION.

Dr. Taylor—All metals in a fluid state have a tendency to assume a globular form. In our amalgams, one of the limitations is

due to this. Another limitation is the color; another, lack of edge-strength. These are somewhat modified by recent methods. There is more in the method than in the material. I am opposed to the theory that the lack of amalgamation is beneficial. Take a piece of any alloy, put mercury with it, and it will be drawn into a globule; so if you have an imperfectly mixed amalgam it will assume a globular form. If placed in too dry, you have on the edges a sandy result; if there is too much mercury, you will have a mercurial edge. Amalgam needs thorough trituration; not merely tapping it to draw the mercury to the surface at the edges. It is better to break up the crystallization of amalgam.

Copper amalgam is wonderfully good to keep its form, but there is one objection, that it sometimes will not harden readily. It is not particularly injured by a surplus of mercury, so it is better to have too much than not enough. In the use of copper amalgam we cannot utilize tin for removing the excess of mercury; it will leave a rough and pitted surface to the filling.

The places suitable for the use of copper amalgam are in young persons, in adults with imperfectly organized teeth, and in buccal cavities in second and third molars. A little moisture during its insertion does not materially affect it, but it is best to have it dry. We have not much edge strength with any amalgam, so it is necessary to have good edges to the cavity at nearly right angles.

The supervisor of clinics read his report at this point, and it was discussed in connection with Dr. Ames' and Dr. Ottofy's papers, the discussion of which had been postponed till now.

Dr. Crouse—I would like to ask if it is a safe practice to inject cocaine into the gums. It seems to me it would be unpleasant to have a syringe forced into the soft tissues, as we saw it at the clinic. It scared me somewhat to notice how long it took the one patient to rally from its effects. Physicians are growing afraid of it.

Dr. Sitherwood—Speaking of matrices, I think the profession has gone wild on this subject. It takes up too much time to apply them. Nearly every operator uses the hand mallet, but I think the automatic or electric plugger will save time and should be used more generally than they are. I deplore so careless a use of cocaine in extracting teeth. There are many physicians lying in their graves to-day owing to this drug, and its use should not be encouraged.

Dr. Ottofy—I think the clinics were good. I would criticize, however, the manner in which Dr. Morrison replanted the tooth. It had lain on the table for a time, when it was brought to his notice. He then filled the roots and crown, and when ready to replace it he scraped out the cavity slightly and pushed the tooth back. I question the propriety of such practice. There was no germicide used, and I believe it is safer in these cases to employ some such agent. As to the injection of cocaine in extracting, I was disappointed in the results. I think there was no diminution of pain.

Dr. Morrison—A few words as to the case of replanting. I want it distinctly understood that I am afraid of all manner of bugs, but my fear does not extend to the species indicated by Dr. Ottofy. I am careful of the air I breathe, and the water I drink, but I do not believe in the use of such powerful remedies as have been employed in this connection. In my experience I had secured success before these remedies came into use as since, and therefore I feel no fear in my manner of procedure. It is simply a surgical operation, and when we make a wound in any part of the body we do not need to wipe it out with any remedy. All that is necessary is to bring the parts together and allow the serum of the blood to act as a cement. The case at the clinic was not a favorable one. The external plate of the alveolus was somewhat broken and the tissues lacerated in extraction, and although the tooth looked as if it might go easily to place, yet I found some difficulty in retarding it.

Dr. C. N. Johnson—We must not forget some of the points in connection with Dr. Ottofy's paper. The essayist made the statement that it was never advisable to use tin and gold to fill cavities in molars and bicusps, because gold itself could be used to better advantage in these cases. There is one instance that comes to mind, in which I believe tin and gold preferable. In the fissure cavities in children's teeth we can obtain better results by its use than if we attempt the insertion of gold. It can be inserted quicker, and it is seldom necessary to apply the rubber dam. If it does get slightly wet it is not so much affected as gold, and requires much less consolidation. In regard to the use of the matrix, it seems to me that these gentlemen who condemn it so emphatically have not been in the habit of using it judiciously. For posterior

proximal cavities in molars and bicuspid I prefer the Brophy matrix. It is easily adapted and sufficiently yielding at the margins of the cavity to admit of perfect adaptation of the filling material. The argument has been made against the matrix that it consumes time in its application. In reality it requires but a moment to apply it to any ordinary tooth. Another objection has been made that it obstructs the view of the cavity, but with posterior proximal cavities this is not the case. This objection, however, does hold good if the broad band matrix is used in anterior proximal cavities. For these cases I have used a narrow matrix, made by breaking an old watch spring into pieces about half an inch long, and grinding one edge so as to make it convex. The spring has about the proper curve for a matrix, and the convex edge will dip down so as to cover the cervical margin of the cavity, even though it extend below the gum. This matrix is intended to cover only the cervical third of the cavity, thereby forming a pocket at this point, into which the first pieces of gold may be wedged without the necessity of drilling any grooves or pits for starting the filling. It leaves the cavity fully exposed to view, and it can be fastened in position, by means of a wedge dipped in sandarac varnish, in much less time than it would take to form starting points in the tooth structure. One word in regard to the practice of drilling a vent-hole in an abscessed tooth, and leaving it open permanently as a means of relief. It is a painful reflection that it is necessary in this age to condemn such a procedure as that, but it does become necessary, from the fact that it is sometimes practiced yet in localities that are otherwise supposed to be civilized. It is a slovenly, careless, cowardly way of avoiding an issue, and should be criticised in the harshest terms.

The essayist referred to the greater ease with which tooth structure could be cut by the use of revolving instruments in the engine than by those used in the hand. I feel like agreeing with him in this. I am aware that many of our older and better dentists strongly advocate the use of excavators for cutting dentine and shaping cavities, in preference to an extensive use of burs and drills in the engine; but my experience is that with sharp burs, having fine blades, and revolved rapidly, tooth tissue may be cut with greater ease to the operator and less pain to the patient than by any other means. Precision and delicacy of touch is necessary in the

manipulation of the hand piece of an engine to which the best results, but when this is mastered our work in the preparation of cavities becomes simplified.

Dr. Crouse—This subject of the matrix has put a little more talk into me. This appliance is attracting much attention, but I would like to ask if it does not require more time to adjust it than to start the filling without it. You want no retaining points at the cervical margin. If the first piece of gold does not stay in place, hold it firm with an instrument. Do not condense too much in the beginning, but take a large ball of gold and press it into place. I do not like to see a ligature tied around each tooth; it is too liable to set up periosteal inflammation. I also want to condemn the use of so much tin and gold. It has no advantage over gold alone in fissure cavities in children's teeth. You can use gold in a wet cavity just as well as tin and gold, by wedging it into the fissures. One objection to the matrix is that you cannot contour a filling properly with it, and another is that it is in the way.

Dr. Pruyn—The cases in which we use cocaine are varied. In answer to Dr. Ottoby's statement, that there was little diminution of pain from its use, I will say that if he accepts the verdict of the patients, he must believe that there is considerable immunity from pain. In one case it seemed to have no effect, but no drug is uniformly reliable. I am glad the unfavorable case came near the close of the clinic, as it presented a fitting opportunity to extend a warning against using it freely in all cases. It was one of those cases in which we would use no anæsthetic, and I expected trouble. There was general anæmia, and the patient fainted easily on account of having been recently injured. There was no collapse, but if we had pushed the remedy we would have had a sinking.

Dr. A. W. Freeman—I fear in some cases we see only its temporary effects. I have heard an eminent gentleman say he would hesitate to use it in the region of the mouth for fear of paralysis of the parts. In regard to filling, one important point is to avoid too much pounding of the gold at the margins, for fear of breaking them.

Dr. Moody—I am a country dentist, and wish to speak of Dr. Crouse's extreme advocacy of gold. The fact is, dentists in the country cannot afford to use so much gold; they cannot get paid sufficiently for it. For an operator to pack gold into teeth so as to

make a respectable income out of the fees we get in the country, is simply to pack himself into his grave. I do not wish to lower the status of dentistry, but there are many of our patients to whom it would be a grievous burden to pay a just remuneration for having gold universally used in their teeth. I can show a tin and gold filling in the crown of a tooth that has been there fourteen years. Sometimes it is not so permanent, but properly packed it will often last as long as gold. There are times when it is advisable to use something less trying than gold, and in fissures it can be packed so it will not wear out.

Dr. Newkirk—I wish to say something about amalgams. I believe it is not so much in the kind of amalgam as in the way we use it. There is a field for it in the class of cases Dr. Moody has cited, but much depends on its manipulation. When an amalgam is inserted it must remain undisturbed. In large fillings we should hold the material in place till it is firm, and for this purpose I use a matrix made from thin copper, leaving it on till the filling is set. The matrix is made in a moment by having the copper of a suitable width and fastening with soft solder. It is a wonderful assistance in packing amalgam. You can mallet it very dry, and can contour the filling. The matrix may be left on till the following day, and then the filling polished with strips and disks the same as gold. Without the matrix you are not positive that a large amalgam filling is not disturbed before becoming hard. I have some doubt about the copper amalgam since Dr. Ottofy's report of the metallic taste. So much copper is probably not healthy in the mouth. Dr. Ottofy spoke of putting in this filling under moisture. I cannot see the necessity of this in any case. In a child six years old you can hold the rubber on long enough to insert a filling.

To keep buccal cavities in molars dry, I pass the rubber over the tooth and hold it above the edge of the cavity with an instrument in the left hand. I seldom find a cavity I cannot keep dry.

Dr. Lawrence—We are better operators than we were twenty years ago, and I would like to ask why it is we are progressing. It seems the spirit which produced this progress has changed. Dr. Pruyn has come as a specialist, and he took this risk for our benefit. It was a practical manifestation, and those who saw it were benefited. We have learned more by these demonstrations, and also by illustrations on the blackboard, than by any other means.

Subject passed.

(TO BE CONTINUED.)

Editorial.

VALEDICTORY.

With this number THE INDEPENDENT PRACTITIONER opens a new chapter in its not uneventful history. Like a fair bride, it leaves the home which it has known so long, and the care of those who have tenderly watched its budding growth, and becomes the center of another circle, the object of the affections of a new relationship. The simile seems not inapt, for the journal has passed the period of its immaturity. It was born in southern climes, and its days of infancy were passed in scenes unfamiliar to its later years. It was not a particularly healthy or promising child, but it was always bright and interesting. When it came under the care of its late guardians, and was removed to the more inspiring, if not so genial, atmosphere of its northern home, it began straightway to grow at an encouraging rate, and has developed into a strong and ruddy life. Its days of childhood passed, and those of full adult life having been reached, it no longer can rest content with being but an inmate, albeit a loved one, of another's home, dividing the care and attention with other and older children, but demands a separate establishment and the exclusive devotion of him to whom it is entrusted. It may even be that it shall take upon itself another name—that of its new-made relations. But though it may go out from its old home, it will not cease to be the object of the love and solicitude of its old sponsors, but has rather only enlarged its circle of friends and drawn about it a yet wider household.

To abandon the figure and come down to plain facts, the INDEPENDENT PRACTITIONER has outgrown its surroundings. Its readers will bear witness that it has not been given to undue selfishness in the past, and it may therefore be permitted a few appreciative words at the present.

When the editor, six and one-half years ago, first became connected with it, the Journal was published by its founder, Dr. H. M. Wilkerson, and it had both medical and dental departments. But two or three numbers were issued when the medical editor resigned, and the dental editor assumed the sole direction of its pages. About the same time Dr. Wilkerson found himself obliged to withdraw from the undertaking, and the Journal passed into the hands

of its editor, who, however, soon found himself unable to carry the burthen alone. A syndicate of dentists was therefore formed, and with a very few changes this Association has since conducted the journal in entire unanimity of purpose and in unbroken harmony. Commencing with a mere handful of paying subscribers, they have seen the almost unknown journal grow into an established and honored position, until to-day it stands at the head of independent journalism, with a name that is known and respected wherever educated dentistry has an existence. It has always labored for the good of the profession which it represented, and has always kept its record clean. With each half year it became necessary to increase the size of the edition, and its business relations were constantly augmented, until now few realize the magnitude of the labor connected with its issue.

All of those who have been actively connected with it are dentists in full practice, and the only time that could be devoted to journalism were the moments stolen from sleep and honestly earned rest. The hour has come when the editor, especially, upon whom the main labor has fallen, must choose between a practice which demands all his attention, and the duties attendant upon his office. He is not competent for both, and has already made too large drafts upon his physical life. He chooses to stick to his earliest love, and give to dentistry all that there is in him, and therefore he retires from the editorial chair. The INDEPENDENT PRACTITIONER has been largely the child of his brain and his affection, and to attempt to convey the impression that he leaves it without regret would be mere affectation; and he desires to carry with him the respect and regard of all who have so long patiently listened to him, and he hopes and trusts that there are many readers who will part from him with regret. That he has made mistakes no one knows better than he, for he had his trade to learn, but he knows they were errors of the head and not of the heart, for the best interests of dentistry have ever been his honest aim.

He cannot allow this opportunity to pass without rendering to his late associates the homage of a grateful heart for their constant and unwearied forbearance—too often sorely tried he fears—and for their unfailing support and sympathy when, during the years of the past, they were so urgently needed. He has tried always to be

guided by their advice, but unfortunately they were not at his immediate elbow, and in consequence he was too often obliged to assume a responsibility and be answerable for results which their better judgment might have beneficially modified. For six years have we worked in harmony, without a misunderstanding to break the monotony, and the editor had really begun to believe that there must be something of good in him or he could not have secured the friendship of such men as composed the New York Dental Journal Association. Trusting that the journal has but entered upon a new career of prosperity, commending the new editor and his associates to his old readers and assuring them that his interest in the *INDEPENDENT PRACTITIONER* is still an active one, the old editor resigns the helm to one who proposes to give to the journal his undivided attention.

W. C. BARRETT.

THE NEW SYNDICATE.

In assuming the editorship and business management of the organ of the International Dental Journal Association we feel that we have taken a heavy load of responsibility upon ourselves. We have entered upon the work in the belief that by so doing we can best serve our chosen profession, and with the full knowledge that it is to be largely a labor of love. The grand strides made in dentistry during the past few years seem to demand a journal that shall represent the spirit of progress. No personal interests shall be allowed to interfere with its pronounced mission of working for the best good of the dental profession, which has outgrown the trade journals of the day. They have served a very good purpose in the past, and will continue to supply the demand for which they are intended, viz., the distribution of monthly catalogues.

The success of the present movement is the strongest evidence of the needs and wishes of the profession at the present time. It is no ephemeral growth, but an impression that has steadily increased until it has culminated in this pronounced expression in the interest of independent journalism. The *JOURNAL* is to be published by the International Dental Journal Association, the stock of which is now on the market. Every man who can possibly afford it, and who has the interest of his profession at heart, should take some stock.

In order to insure that the control of the JOURNAL shall remain in the hands of the profession, none but dentists in actual practice will be allowed to subscribe for stock. The stock is non-transferable, except to the association issuing, and to which it must be sold at its appraised valuation when the party holding it desires to dispose of it, either from pleasure, failure or disease. The association may replace stock so coming into their possession. In order to prevent the control of the JOURNAL getting into the hands of the few, the number of shares that any one person may hold is limited to four.

The management of the JOURNAL is to be in our hands, subject to the supervision of an Executive Committee. The executive officers and committee are to be elected annually. A permanent organization has been formed, and every safeguard has been employed to insure perpetuity. The executive officers for the ensuing year are Louis Jack, President; Benjamin Lord, V. President; Geo. S. Allan, Secretary; C. N. Pierce, Treasurer, and O. E. Hill, Chairman of the Executive Committee. In inaugurating this enterprise we consider ourselves fortunate in having secured a coalescence with THE INDEPENDENT PRACTITIONER. It was only after repeated conferences that Dr. Barrett and the Executive Committee of the N. Y. Journal Association were convinced that our plans gave promise of a wider field of usefulness, and that they could better serve the profession at large by uniting with us. THE INDEPENDENT PRACTITIONER has always taken high ground for the good of dentistry, and its columns have been open to contributions that looked toward the elevation of the standard of dental education. Drs. Barrett, Carr, Francis, Hill and Bödecker, who have done most to advance the interests of THE INDEPENDENT PRACTITIONER, have come in heartily with the new association, and while, by the new arrangement, they will be relieved of the arduous duties that formerly devolved upon them, will yet be found actively engaged in promoting the cause of independent journalism. The amount of labor they have given toward establishing the PRACTITIONER upon a solid basis will never be known to any except themselves. The profession owes them a debt of gratitude for their unselfish efforts expended in its behalf. It is to be hoped that the movement will receive more encouragement in the future than in the past. We shall at least do our part in presenting the matter fully before the profes-

sion. In order to accomplish this, Dr. Barrett has kindly consented to issue the August and September numbers of the JOURNAL.

The delay in issuing the present number was due to the necessary changes connected with the transfer of the journal to the new syndicate. Hereafter we shall try to mail regularly on the last day of the month. Starting with the *INDEPENDENT PRACTITIONER* as a basis, it is not our intention to make any radical changes either in the form or policy of the journal until the close of the present volume, when a new name will be chosen, and a marked change in dress will be given to the journal. Enlargements will be made from time to time to meet requirements. We intend to publish a live journal, and one that shall be "in touch" with the profession. After thoroughly discussing the matter it was decided that the best way to do this was to make the journal the absolute property of the profession. The success of the *PRACTITIONER* has been undoubtedly due to this policy, and we hope, by increasing the number of stockholders, and at the same time adding to the capital stock, to increase its sphere of usefulness. Knowing full well that large bodies are apt to become unwieldy, we have taken every precaution to prevent this by thorough organization. Working committees have been appointed with specified duties to perform. Efforts have been heretofore made to organize the profession, but without marked success. Such movements have been carried on successfully in medical journals, and we see no good reason why the same cannot apply to dental journalism. The success of the *PRACTITIONER* in the past gives every promise for the future, and we look forward to the day when the *PRACTITIONER* will be the journal in circulation as it is now in merit. To this end we desire to interest as many persons in the movement as possible, and shall endeavor to unite the entire profession in it. We shall make it international in character by appointing correspondents in all foreign cities where men of note can be found. Those who have been most active in promoting the interest of the enterprise are confident that the times are now ripe for the establishment of a first-class journal that shall be untrammelled in its endeavor to advance the cause of higher education. The character and number of the men who have already taken stock in the association give assurance of success from the beginning. One of the surest signs of the growth of the dental profession is this very demand for inde-

pendent journalism, and in our effort to supply the demand we are but voicing the needs of the profession. That our efforts may be successful we ask your hearty coöperation and considerate indulgence when needed.

W. X. SUDDUTH.

THE NATIONAL ASSOCIATION OF DENTAL FACULTIES.

As the time for the annual meeting of the Association of Dental Faculties draws near, their prospective action becomes the subject of consideration. Rumors are rife of disaffection, and the possible withdrawal of some of the colleges from the Association. We have done our best to fathom these rumors, and find nothing positive in them. The general feeling among the colleges, so far as we have been able to make out, is that the organization deserves a still further trial. That misunderstandings have arisen, and that certain colleges have not lived up to the requirements of the Association, there can be no doubt, but these may in many instances be excused on the ground of a lack of a full understanding of the regulations adopted; all new organizations require time to adapt themselves to the needs for which they were intended. We should advise a spirit of leniency and charity for shortcomings at the present session. At the same time encourage full and free discussions in all cases. Petty jealousies should not be allowed to creep in and endanger the existence of an organization that gives promise of so much good in the future. Resolutions looking toward instructing the Association should be passed by the several societies that hold their sessions during the present month. The Illinois State Society led off in the right direction in the resolution offered by Dr. A. W. Harlan, and published in the June number of *THE INDEPENDENT PRACTITIONER*. Under our present system of education our colleges, to a large extent, are private institutions. The passage of laws looking to the control of the practice of dentistry have, in a measure, compelled the colleges to respect the statutes of the several States where laws have been passed. No State has, however, to our knowledge, taken any action toward establishing any set time which a student must fulfill in order to meet the requirements of the law. We must look to the colleges themselves for the adoption of a uniform course of instruction, which is so desirable, if we would have the degree represent any degree of uniformity.

A free expression upon the part of the laity, as represented in the dental societies of the country, would do much to bring about the desired end.

The journals of the country can also do much, and ought not to hesitate to publish any cases of bad faith on the part of any of the schools represented in this organization, should any such occur. The *INDEPENDENT PRACTITIONER* has borne its part in the past, and we will guarantee that its position in the future shall not be an equivocal one. We see in the Association of Dental Faculties an unlimited power for good. At the last meeting of the Association held at Washington, twenty-four colleges were represented. Such an organization of the corporate teaching bodies of our country has never before been known; and if it receives the hearty support of the profession, great things may be looked forward to from its action.

One of the most urgent demands at the present time is an extension of the course of study. Perhaps all that can be expected at the present is two full courses of seven months each; but all look forward to the time when three years of study shall be requisite to obtain a dental degree. Our students are rushed to death to fulfill the required curriculum now laid down in two short terms of four or five months each. Sufficient time is not allowed for the acquirement of practical laboratory training. Our students come to us now without the previous instruction formerly desired in a preceptor's laboratory, and are immediately merged into large classes, where that personal instruction which is necessary to perfection cannot possibly be given in the short time required. It is true that students who have not had the advantage of previous study in private laboratories are required to attend a spring course of lectures, or else take a preceptor while attending their regular winter course. That the latter clause has been greatly abused is only too evident by looking over the catalogues of some of our most prominent schools. Professors are down as preceptors who have no laboratories, and in some instances are not even engaged in dental practice. We are fully convinced that a return to the former regulation of a year to be spent in a preceptor's laboratory would be beneficial. No institution can assume the same close relationship to the student that is possible by a practical dentist in general practice.

As it now stands, when a student comes to our institutions, he is turned over to the assistant demonstrators, who, as a rule, are undergraduates, or graduates of short standing. Such instruction cannot supplant personal instruction in private laboratories. The result of this change of base in our educational institutions has been decidedly detrimental, but few of the graduates of our colleges at the present day, who have depended upon the course of study prescribed therein, are competent metal-plate workmen. But few know anything practically about crown and bridge-work, and a less number can make a continuous gum or porcelain plate, unless they have taken additional special instruction from a specialist in that line and have paid an extra fee therefor. The majority of students graduate with the rudiments of dentistry only, and must look to private instruction for the completion of their dental education or go without. Under the existing conditions, which are only too palpable, how can any honest objection be made against the extension of the length of time required to complete the course of instruction? It has been argued that four or five months is a sufficient length of time for a lecturer on any dental subject to go over his branch thoroughly. If that is the case, the number of didactic lectures for each week should be decreased, and the student given more time for practical work in the laboratories. The present tendency of dental therapeutics is toward the antiphlogistic treatment of dental diseases. To understand correctly this line of treatment, it is absolutely essential that the student should have practical work in the histological and pathological laboratories—more attention should be given to the practical laboratory work in chemistry and dissection—more time for thorough preparation is urgently demanded for entrance upon the practice of one of the grandest specialties in medicine, but which can only be practiced as such by those who have earned the right to such a position by broad culture.

OUR esteemed contemporary, *The Western Dental Journal*, in commenting on the announcement in the *Ohio Journal of Dental Science* of the establishment of a three years' graded course in the University of Michigan, lays itself open to being misunderstood. *Ye* Editor surely does not desire to place himself in opposi-

tion to higher education or in the position of wishing to limit the possibilities of dental education. He says:—

"If the University of Michigan wishes to teach preliminary science in connection with dentistry, well and good; let it increase the length of its term as much as it will; but if it expects to continue as a purely dental school, its professors cannot possibly find material to fill their time except by padding their lectures with extraneous matter more or less foreign to the subject of dentistry."

In the interest of the profession we would ask the doctor, what is pure dentistry? There exist "vast possibilities" for differences of opinion on this question. We most fully believe that a dentist should be educated with the view of practicing dentistry—that he should be a dentist first, last and all the time; but that he can know too much of the collateral branches we most strenuously deny. Dentistry is a branch of the healing art, and those who practice it as such should be as broadly educated as their means, time and capacity will admit. We most heartily coincide with the stand taken by the University of Michigan, and hope to see many of our schools fall in line. Those schools that do not will necessarily have to accept a back seat, and voluntarily relegate themselves to the position of inferior schools. No college can offer as full instruction in two terms of five months each as can schools that require three terms of nine months each, no matter how good their facilities. The capacity of students to absorb is limited, and no amount of "cramming" will ever stand instead of time given to actual practical work. A student may "book up" for an examination, but not for a life-work.

ANNOUNCEMENT.

The editorial office will remain in Buffalo for the next two months, after which it will be removed to Philadelphia. Editorial communications may be sent, for the present, directly to Dr. Barrett. Communications sent to the Secretary, Dr. Geo. S. Allan, 51 West 37th Street, will also receive prompt attention. We are anxious to obtain anything in the form of news or current items that is of interest to the profession. Send us your bright ideas on postals; don't wait till they grow to full-fledged articles; we will find space for all such squibs, and welcome.

BIBLIOGRAPHICAL.

THE PATHOLOGY, DIAGNOSIS AND TREATMENT OF THE DISEASES OF WOMEN. BY GRAILY HEWITT, M. D., London, F. R. C. P. Professor of Midwifery and Diseases of Women, University College, and Obstetric Physician to the Hospital, etc., etc.

A new American, from the Fourth Revised and Enlarged London Edition. Edited with notes, additions and illustrations, by H. MARION SIMS, M. D. Three octavo volumes of over 1000 pages and 240 illustrations. New York: E. B. Treat, 771 Broadway. 1887.

These three volumes form numbers 7, 8, and 9 of the valuable series denominated Medical Classics. The author is a very clear and forcible writer, and he does not follow the beaten track pursued by others, but presents many new, original and valuable suggestions. For many years his great work has been accepted as a standard by the profession, not alone of England, but of America as well, and it has been adopted as a text-book in many medical colleges. The edition from which this is published was in great part rewritten, and the added experience and knowledge of ten years was embodied in it. Dr. Sims then gave it a thorough revision, offering many original comments and criticisms, and making many valuable additions to the text and the illustrations. It will be readily conceived, then, that its completeness and thoroughness cannot be called in question. It is, in fact, an exhaustive treatise of the subject, and with these volumes in his possession, the physician or specialist will have comparatively little need of anything further, for they form a library of themselves.

The work is especially valuable in its consideration of the predisposing causes of changes in the shape and position of the uterus, the fruitful source of the so-common ailments of the women of America. The author believes that these are seldom seen except when the general strength has been reduced by a systematic and frequently long continued practice of taking too little food. This he believes predisposes to uterine displacements, and the treatment recommended commences with a more careful attention to hygienic conditions and thorough nutrition. He reverses the theory that is too often advanced, and teaches that local ailments largely depend upon general ones. The illustrations will commend themselves to the general practitioner, from the fact that they are, as far as possible, of the exact natural size of that which they represent. The

volumes are handsomely bound and will form an attraction as well as useful addition to any physician's library.

LECTURES ON DISEASES OF THE HEART. Delivered at the College of Physicians and Surgeons, New York. By ALFRED CLARK, M. D., LL. D., Emeritus Professor of the Principles and Practice of Medicine. New York: E. B. Treat, 771 Broadway. 1887.

CONTRIBUTION TO THE STUDY OF THE HEART AND LUNGS. By JAMES R. LEAMING, M. D. New York: E. B. Treat, 771 Broadway. 1887.

These two volumes form the fifth and sixth numbers of Treat's "Medical Classics." Dr. Clark was for many years known as, in many respects, the most accomplished teacher of medical practice in America. As a lecturer he was direct, forcible, clear and logical. To such a complete system had he reduced his teachings that there was little difficulty in following him and comprehending all he said. He was eminently "instructional," and that is a leading characteristic of his book. All the charms of his didactic lectures seem to be preserved in its pages, and even when one opens it at random and commences a kind of aimless perusal, he is certain soon to have his interest aroused and to follow the chapter to the end. Then a moment's reflection will probably surprise him at the amount of information which has been given. Furthermore, it has been presented in such an attractive manner, and the subject has been made so clear and lucid, that the points made will not soon be forgotten. In fact, the book reads like a novel, and the subject matter is as easily followed as a biography. It is admirably adapted for "pick-up" use—for reading at odd minutes—because its every sentence is so clear that it will stand alone.

The work of Dr. Leaming is more general in its scope, inasmuch as it covers, not only diseases of the heart, but of the respiratory organs and others which are relative to them. It is a collection of monographs, which first appeared as contributions to medical journals and papers read before medical societies. These are now systematized, connected and published in book form. Prof. Leaming is known as a very acute observer in pathological conditions. He has a natural quickness of ear and perception, and these have been cultivated by many years of practice almost to the point of perfection. As a consequence, his judgment in questions of diagnosis is always remarkably clear, and he is enabled to point out to the student

many facts and symptoms which a less careful observer would miss altogether. In the consideration of the studies of the therapeutics of chloride of ammonium and of mercury, for instance, the author has given the most minute attention to the effects produced by their exhibition, and from these observations, which are recorded with great particularity, he is enabled to deduce many useful lessons. The book is undoubtedly a valuable contribution to our knowledge of chest diseases.

THE STUDENT'S MANUAL AND HAND-BOOK FOR THE DENTAL LABORATORY. By L. P. HASKELL. Philadelphia: The Welch Dental Company. 1887.

Dr. Haskell is too well known in prosthetic dentistry to need any introduction at our hands—or, indeed, those of any one else. Possessed of intuitive mechanical intelligence, and with a life-time of solid experience back of him, his suggestions to the dental student are worth attention. He is one of the “old-timers” who did not learn his profession in the age of the “cheap and nasty.” In the student days of Dr. Haskell dentists were not made in three months, and there were no diploma mills to grind out a batch on the shortest possible notice. At that time a knowledge of metallurgy was a necessity, and the dentist who was not quite competent to refine his own gold, roll it out and work it into any conceivable shape, could not get a situation as a sweeper and cleaner. Many of his hints are thrown away upon students of the Baconian school, whose fit-out consists of a pair of forceps, a lathe, a vulcanizer and two or three scrapers. But he who proposes to work a laboratory for what it is worth will find much that is valuable. To be sure, we cannot always agree with him, and some of his methods we long ago discarded, while he condemns some of our pet notions, but these are usually the results of habit, and Dr. Haskell's mode of working will commend itself to very many.

UEBER BISSARTEN UND BISSANOMALIEN. Ein Studie von Dr. ALFRED STERNFELD, Approb. Arzt in München.

(Different Forms of Bite and Bite Anomalies. A study by Dr. Alfred Sternfeld; a Qualified Physician in Munich.)

This is a work that deserves more attention than can be given it in a brief review. The author says that as he finds the term “bite”—occlusion of the teeth—practically unknown in medical literature, he feels called upon to define it, which he does in a gen-

eral way, as the manner in which the lower teeth meet the upper; in a special sense, the position assumed by a toothless mandible toward one that has teeth. In this view he proceeds to describe all forms of normal bite, and how they can be influenced artificially. The second half treats of abnormal bites in the same systematic manner. An index and a brief resumé of the literature of the subject makes this useful work yet more complete.

The author criticises dental nomenclature, and sometimes very justly. For instance, while, as he says, the terms "discal" and "mesial" are accepted in dentistry as descriptive of the sides of the teeth, they are in that meaning unscientific, and should properly be applied to the cutting or grinding surfaces, and the root ends. The work is profusely illustrated, but we cannot say much for the artistic value of the cuts.

DAS FÜLLEN DER ZÄHNE BEI INTACTER PULPA. VON LUDWIG WARNEKROS, ZAHNARZT IN BERLIN. Verlag von C. Ash & Sons. 1888.

(The Filling of Teeth with Intact Pulpa. By L. Warnekros, Dentist in Berlin.)

This very handsomely printed work is dedicated to the Dental Department of the University of Berlin. After an introductory chapter on Caries, the different methods of filling teeth, the keeping of cavities dry, etc., the author in consecutive chapters considers the different forms of cavities, and the best materials and methods for filling them. The volume is handsomely illustrated, and forms a valuable addition to the libraries of those who read the German language.

PHOTOGRAPHIC ILLUSTRATIONS OF SKIN DISEASES. A complete work on Dermatology. An Atlas and Text-Book Combined. By GEORGE HENRY FOX, A. M., M. D. New York: E. B. Treat, 771 Broadway.

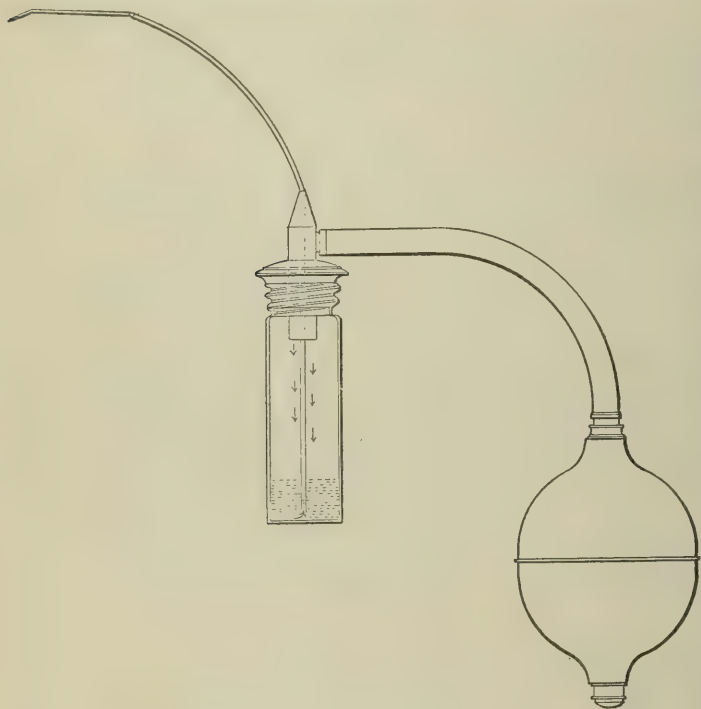
Parts Three and Four of this invaluable and beautiful work contain illustrations of Eczema (rubrum et squamosum, squamosum et intertrigo, faciei et barbae and syphiloderma) Syphilis, Trichophytosis, Dermatitis and Psoriasis. Some of the hand-colored plates are wonderfully true representations of these diseases, and the series will be simply essential to every dermatologist.

(A considerable number of pamphlets and small publications have reached us, but it is absolutely impossible that we should find room to notice them in this number.)

Current News and Opinion.**A NEW DENTAL SYRINGE.**

BY M. G. JENISON, M. D., D. D. S., MINNEAPOLIS, MINN.

Recently there have been several suggestions in the dental journals as to the best method of keeping syringes in order. When they are not so we all know the annoyance that results, such as a dry piston that requires a long time to put in operation, and leaky packing that allows the medicine to drop on the operator's hands or upon the patient. If a bulb syringe is used it soon breaks and



leaks, but the almost absolute necessity for some instrument of this description is met with every day in any full practice. In abscesses, necrosis, pyorrhœa, etc., the remedial agent must be brought in contact with the diseased part to produce the best result, and as in many cases we wish to employ two or more remedies so is the annoyance of some forms of syringe increased by the time and trouble required in changing and cleansing.

My Syringe, as shown in the drawing, is different in principle and application from any I have seen for dental purposes, and to me has been the most satisfactory of the many I have tried. As will be seen, no piston is employed, the air pressure or cushion taking the place of it, and that does not become dry and fail to work. The bulb used to apply the force can be as easily controlled as any piston, and is so situated that the medicines do not enter it, the air entering the bottle at the top, forcing the remedies down and through the tube, starting at the bottom. If any of the air should pass entirely through to the seat of the disease, which is not likely, it first passes through the medicine, rendering it harmless.

The screw-topped bottle admits of rapid changes and thorough cleansing. The bulb and attachment are of rubber, and the tube leading from the bottle is

of metal. Platina is probably best for this, though not necessary, but whatever is employed should end in a fine gold point. In the use of this syringe, as with some others, an assistant is an advantage, but not a necessity. The force can be varied from that which will carry only a few drops through the point of the tube to that which is strong enough to force a remedy through any stenosis tract, or to thoroughly cleanse any sized ear that we are liable to meet with.

All that I claim in this is a new adaptation of established principles, and one that has given me complete satisfaction where pathological conditions requiring this form of treatment exist.

GAS FURNACES, ENAMEL, FILLINGS, ETC.

A REPLY TO DR. WILLIAM HERBERT ROLLINS' ARTICLE IN THE PURE SCIENCE OF THE INDEPENDENT PRACTITIONER.

BY C. H. LAND.

The cases Dr. Rollins has cited have no relation to my improvements, which he openly confesses in the sentence in which he admits that I was entitled to the use of nitrogen and the arrangements of parts. We want no better evidence of his entire ignorance of the valuable features of these inventions. The mere assertion that he is entitled to the original discovery is no evidence of the facts. My greatest surprise is that in one instance he claims to have injected hot air into the muffle and then indirectly admits that it was in the combustion chamber, and in another sentence he openly declares that I originally produced a separate means for the purpose of injecting nitrogen into the muffle. Did he realize that the atmosphere could pass through this same separate arrangement of parts? And when he supplements his remarks with the assertion that he could not comprehend why this was so constructed, did he realize that this difference was one of the most valuable parts of my invention? Such testimony is all the evidence needed to vindicate my entire rights.

Since my furnace has been on the market for upwards of four years and is in use in nearly every State in the Union, also in foreign countries, and it was on exhibition before the American Dental Association in August, 1899, demonstrating my system of restoring and filling teeth with porcelain, also at various dental societies years previous to this, is it not surprising that he has only just discovered that such things are actually successful? In the references cited he has not even thought of or referred to the fixed gas, CO_2 . He merely asserts that gasing is due to certain impure parts of the material being reduced. If he would like to know just what the reaction is, I will accommodate him, and as he seems to be somewhat familiar with school-boy notions, I will be glad to receive and welcome all those who have not out-grown their youth.

I can produce witnesses who assisted me in my experiments with furnace and porcelain many years previous to any dates that Dr. Rollins has mentioned. I can show by the files in the Patent Office that my furnace was on record one year previous to the cases he has cited. I will also produce several witnesses

who can testify to my experiments with nitrous oxide gas and coal gas in the blow-pipe, as also pure oxygen and coal gas, oxygen and hydrogen, and the effects of nitrogen in combination with them. All these, including the injection of the atmosphere into the muffle, were successfully applied to coal furnaces anterior to the production of any gas furnace. In conclusion, as Dr. Rollins has intimated that he does not care to refer to this matter again, perhaps it will be just as well to let it rest here.

IS DENTISTRY A LIBERAL PROFESSION ?

When the American Medical Association instituted a section on dentistry, it recognized to a degree the claim of some dentists that their art is properly one of the legitimate specialties of medicine. While it is unquestionably true that dentistry should occupy this position in medicine, it is just as certainly true that at the present it does not. The education in dental schools is not that given to doctors of medicine; the restrictions of dental practice, and the legal requirements of dentists, are not those that are applied to physicians, and, especially does the true professional sentiment, the *esprit de corps*, seem to be woefully lacking among our brethren of the forceps and drill. If dentistry would lay claim to the prerogatives of a liberal profession, it must first establish the justice of the claim, and this cannot be done at present.

One of the most noticeable derelictions of dentistry, one that is neither creditable nor humane, is the general lack of charitable work by the fraternity. If dentistry is only a luxury that those who pay can have, but that the poor can very well do without, there is no need for gratuitous work, but no dentist will admit that his vocation is anything but a necessity to the people. If, then, the views of the dentist are accepted as true, we have an immense population with an urgent need which cannot be gratified, because there is no provision for charitable work. In Allegheny county, with a population of half a million people, with charitable organizations covering nearly the whole field of human necessities, the dental profession alone withholds its gratuitous services. Doubtless there are benevolent individuals in the guild who give their skill sometimes to suffering poverty, but this is not enough; it is in such cases a personal, and not a professional benevolence. What is needed is an organized charity, a dental dispensary for the poor. This will in itself do much to lift dentistry out of the realms of trade, and clothe it with the dignity of a liberal profession — *Pittsburgh Medical Review*.

It is sometimes well to view ourselves as others see us, and to obtain a lesson from our critics. For this reason we give place to the above at the request of a dental friend.—EDITOR.

AMERICAN DENTAL ASSOCIATION. SOUTHERN DENTAL ASSOCIATION.

A joint meeting of the two Associations will be held in Louisville, Ky., commencing August 28, 1888. This will be the 28th annual meeting of the American and the 20th of the Southern Society, and for the sessions the committees of the two have provided the following programme :

TUESDAY MORNING, 9 A. M.—Separate meetings of the two Associations for the payment of dues, the receiving of credentials and the transaction of routine business.

TUESDAY AFTERNOON, 2.30 P. M.—Meeting of the different joint committees for the examination of the papers to be read by them.

TUESDAY EVENING, 7.30 P. M.—(As the joint session is only for scientific and social purposes nothing but professional subjects will be discussed or acted upon.) Meeting of the joint session, to be presided over by Frank Abbott and B. H. Catching. President Abbott's address. President Catching's address. Discussion on the same. Reports of joint committees and discussions thereon. Announcements from the Chair. Adjournment.

WEDNESDAY MORNING, 9 A. M.—Meeting of the joint session, presided over by B. H. Catching.

WEDNESDAY AFTERNOON—To be devoted to the work of the joint committees, or to business meetings of the Associations if such should be necessary, or to clinics.

WEDNESDAY EVENING, 7.30 P. M.—Meeting of joint session, presided over by Frank Abbott.

THURSDAY MORNING, 9 A. M.—Meeting of joint session, presided over by B. H. Catching.

THURSDAY AFTERNOON—Committee work, or business meetings, or clinics.

THURSDAY EVENING, 7.30 P. M.—Meeting of joint session, presided over by Frank Abbott.

FRIDAY MORNING, 9 A. M.—Meeting of the joint session, presided over by B. H. Catching.

FRIDAY AFTERNOON, 3 P. M.—Separate meetings of the two Associations for the selection of place of next meeting, the election of officers, and the transaction of such other business as may come before them.

FRIDAY EVENING, 7.30 P. M.—Meeting of joint session, presided over by Frank Abbott.

SATURDAY MORNING, 8.30 A. M. to 1.30 P. M.—Clinics.

SATURDAY AFTERNOON, 3 P. M.—Separate meeting of the two Associations for closing business.

The joint committees will be called in the following order, and any committee failing to respond will be passed and not again called until all the others have been.

The reports of these committees will be written and offered by the chairman, and will specify the papers to be presented and the order in which they shall be read, and such subjects for discussion or such suggestions as they may wish to bring to the attention of the joint session.

OPERATIVE DENTISTRY—GEO. H. WINKLER, of the Southern Dental Association; E. T. DARBY, of the American Dental Association. Report to be presented by GEO. H. WINKLER.

HISTOLOGY AND MICROSCOPY.—Frank Abbott, of the American Dental Association; John G. McCulloch, of the Southern Dental Association, Chairmen. Report by Frank Abbott.

MATERIA MEDICA AND THERAPEUTICS.—John C. Story, of the Southern Dental Association; A. W. Harlan, of the American Dental Association, Chairmen. Report by John C. Story.

PHYSIOLOGY AND ETIOLOGY.—H. A. Smith, of the American Dental Association; E. S. Chisholm, of the Southern Dental Association, Chairmen. Report by H. A. Smith.

ANATOMY, PATHOLOGY AND SURGERY.—Morgan Adams, of the Southern Dental Association; T. W. Brophy, of the American Dental Association, Chairmen. Report by Morgan Adams.

PROSTHETIC DENTISTRY, METALLURGY AND CHEMISTRY.—J. Rollo Knapp, of the American Dental Association; V. E. Turner, of the Southern Dental Association, Chairmen. Report by J. Rollo Knapp.

DENTAL EDUCATION, LITERATURE AND NOMENCLATURE.—J. Taft, of the Southern Dental Association; W. H. Atkinson, of the American Dental Association, Chairmen. Report by J. Taft.

HYGIENE.—Geo. J. Friedrichs, of the American Dental Association; J. L. Mewburn, of the Southern Dental Association, Chairmen. Report by George J. Friedrichs.

COMMITTEE ON VOLUNTARY PAPERS.—G. F. S. Wright, of the Southern Dental Association; S. H. Guilford, of the American Dental Association, Chairmen.

This committee will examine all papers not previously presented to the other committees, and those that are accepted they will refer to the appropriate committees.

All papers to be read before the joint session, except the two Presidents' addresses, must be placed in the hands of the chairmen of the appropriate joint committees who will examine them and report those only they deem worthy of presentation to the joint session.

The following rules of order will govern this joint session :

No member of either Association shall be entitled to the floor unless he is in good standing and his dues are fully paid.

No person shall speak more than twice upon the same subject nor more than ten minutes in all, unless consent is given by a majority vote of the joint session.

No one shall be permitted to address the meeting before giving his name and residence, which shall be distinctly announced from the chair.

When a paper has been read it shall at once be handed to the Secretary of the Association from which it came.

Any paper or report to be entitled to publication in the transactions must be placed in the hands of the Publication Committee by the 15th of September, 1888, and must be so prepared that the proof-sheets furnished the author shall be returned to the committee without material alteration or addition.

Roberts' Rules of Order shall be the authority governing this meeting, if any is needed more than is embodied in the foregoing rules.

CONNECTICUT VALLEY AND MASSACHUSETTS DENTAL SOCIETIES.

The Connecticut Valley Dental Society and the Massachusetts Dental Society will hold a Union Meeting in Boston on the 10th, 11th, 12th and 13th of July next, at the Institute of Technology.

All the dental societies in New England will be invited to unite with them, so that the meeting promises to be the largest ever held in this part of the country.

Programmes can be obtained upon application to the secretary of either Society.

G. F. FAMES, M. D., D. D. S., 62 Trinity Terrace, Boston, Mass.,
Secretary Mass. Dental Society.

GEO. A. MAXFIELD, D. D. S., Holyoke, Mass.,
Secretary Conn. Valley Dental Society.

NEW JERSEY STATE DENTAL SOCIETY.

The eighteenth annual session of the New Jersey State Dental Society will convene at the West End Hotel, Astor Park, Wednesday, July 18, 1899, at 10 o'clock, A. M., and continue in session until final adjournment. A large number of valuable papers are promised by men of professional prominence, and important clinics in practical work will be given. An unusually large and profitable meeting is confidently anticipated.

CHAS. A. MEERER, Secretary,
27 Fulton Street, Newark.

DENTAL CONVENTION.

A meeting of the members of the Dental Profession in the Province of Ontario will be held in the College of Dentistry, in Toronto, on Tuesday, July 17th, at three o'clock, P. M., for the formation of a Dental Society. The meeting will be continued on the following day, when interesting papers will be contributed by prominent members of the profession in the United States and Canada. All American Dentists are cordially invited to be present on this occasion.

By order,
(JES. C. DAVIS, Secretary), per him.

WISCONSIN STATE DENTAL SOCIETY.

The eighteenth annual meeting of the Wisconsin State Dental Society will be held in Milwaukee, commencing Tuesday, July 17th, and continuing three days. A good number of papers upon dental subjects are promised, and clinics will be given by prominent members of the profession. W. R. WELLS, Sec.

MISSOURI STATE DENTAL ASSOCIATION.

The Missouri State Dental Association will hold its twenty-fourth annual meeting at Pertle Springs, Warrensburg, Mo., July 10, 11, 12 and 13, 1899.

An attractive programme has been presented, and members of the profession are cordially invited to be present. WILLIAM HUBBARD, Pres. Sec.

DR. W. H. TAGGART of Freeport, Ill., has devised an implement which should be in the possession of every operative dentist. It is a Corundum Point and Disk Maker, and for simplicity of construction and effectiveness it is all that could be desired. Moulds for the different forms accompany it, and any office boy or girl can turn out the most perfect corundum points at the rate of twenty or thirty an hour without help from the dentist. We have been using them for some time with great satisfaction. Their cost is merely nominal, and provided with the machine the dentist can use them as freely and with as little regard for economy as though they grew spontaneously, for the supply will be inexhaustible. The forms supplied are admirable, and the points and disks can be made from any grade of corundum, old lathe wheels being utilized in their manufacture. Blank mandrels can easily be made from Stub's wire, gauge No. 42, or they can be purchased at a small expense, and a supply once obtained, they can be used again and again for an indefinite time. We can most heartily commend the machine as an economical investment for every operative dentist, to say nothing of the convenience of a never-ending supply of one of the essentials for good work.

THE FURTHER EXTENSION of the dental college term is talked of in some quarters, which reminds us of a remark made by one of the most experienced teachers in the profession. He had been succeeded in a well-established school by a man of his own teaching, and in answer to our question as to how his successor would get on, said: "He'll have trouble to get through his term." "How so?" "He'll tell all there is of it in less than three months. My own trouble consisted in finding something to say that I had not already said, and at the same time avoid letting the students know that I had not overdrawn my account." "Is that why you bombarded us with two lectures on 'Epochs in Dentistry'?" "Just so." More work and less talk would come nearer meeting the average student's requirements.—*Dental Exchange*.

Hum! Let us see. A three months' course means thirteen, or twenty-six hours of instruction, according to whether the professor in question lectured once or twice a week. If he lectured three times, either the faculty was a small one or some of the rest were cut short. Twenty-six hours! And he overdrew his account—told all there was in his department in a three-months' course—exhausted dentistry in thirteen weeks. Well, we should say that it was high time that he was superseded, and a man was found whose pond was not so soon pumped dry.

THE EDITOR of *The British Journal of Dental Science* is peculiarly unfortunate. He seems to be possessed by a kind of American-dentist-phobia, and members of the obnoxious class will persist in visiting and even settling in London and other English cities; what is worse, they seem to get on very well, and what is worst, Englishmen and English newspapers will magnify American dentistry. The respected editor struggles manfully with the situation, but the tide seems to be against him. We can assure him that there are very respectable men and fairly skillful operators among American dentists, and when they

know a thing they like to have all the rest of the profession want it too. To be sure, there are far too many quacks and unprincipled adventurers, but we have a faint recollection of seeing very vigorous denunciations of certain English dentists in the pages of our good contemporary, and this has led us to suspect that even our English brethren are not untainted by a like class.

P. S.—We see by the last number that a change has come over the spirit of his dream, and our respected contemporary is now "boasting" Dr. E. Francis Brown, who is giving clinics in London, for all he is worth.

THE CHAIRMAN of SECTION VI of the AMERICAN DENTAL ASSOCIATION has sent to the members the following circular: We need not say that answers will be welcomed from any reputable source:

DEAR DOCTOR—Section VI of the American Dental Association (Physiology and Etiology) desires to obtain more exact information regarding implantation of teeth. Will you please aid in the preparation of the report to be made at the annual meeting at Louisville, by answering the enclosed questions and returning the paper promptly to—

H. A. HARRIS, Chairman,

128 Garfield Place, Cincinnati, O.

I. What proportion of your cases of implantation do you regard as successful?

II. If any have failed, what was the cause of such failure?

III. Do implanted teeth assume the color of natural teeth in the mouth?

IV. What do you regard as the mode of attachment, if any?

DR. ROBERT BOYKAL, in the *British Medical Journal*, says that mercuric sublimate (more, *chl.*) and iodine are incompatible. A small addition of the former fixes the free iodine, as may be seen by the immediate blanching of the iodine solution. Carbolic acid and iodine are also incompatible. An exceedingly small admixture with carbolic acid is sufficient to fix the whole of the free iodine. Consequently the two should never be compounded together, and such preparations as carbolates of iodine are of no use. Chloroform sublimate and soap are incompatible, as the latter will throw down the mercury. Carbolic acid is made inert by olive oil, the latter fixing the alcohol. Each has shown that bacillus spores are capable of living and developing after having been immersed in carbolic acid for four months.

REV. W. H. DALLINGER, a well-known microscopist and chemist of England, has been experimenting with micro-organisms to determine their power of adapting themselves to changed conditions. He made cultivations of certain organisms at ordinary air temperature and then gradually increased it at the rate of one degree a month, continuing the cultivation. At 75° F. he reached a point where he was obliged to stop and let the temperature fall a little, as the organisms had reached the limit of their endurance. After two months the temperature was again raised, but at 78° he was again obliged to halt until the successive cultures had become accustomed. At 91° he was obliged to wait nine months, and he succeeded in critical points were found at 101°, 111°, and 118°, when he without doubt ended the cultivation and put an end to the experiment.

DR. WHITELAW says that water forms three-fourths of the weight of living animals and plants, and covers about three-fourths of the earth's surface. Prof. Chaussier dried the body of a man in an oven, like a brick in a kiln, and after desiccation it weighed only twelve pounds. Rather more than a pound of water is exhaled daily by the breath, about $1\frac{3}{4}$ pounds by the skin, and $2\frac{3}{4}$ pounds by the kidneys, making the daily emissions of water by the body about $5\frac{1}{2}$ pounds, or not quite three quarts.—*Scientific American*.

FOREIGN MONEY ORDERS are sometimes sent us without any definite separate advices. Such orders are stopped at the New York post-office and exchanged for American money orders, which are forwarded without the name of the sender, and we have no means of determining to whom they should be credited. When international money orders are sent a separate letter or postal card should inform us of the amount and by whom it is sent.

DR. LAPLACE has found that antiseptic dressings, as ordinarily prepared, do not have the effect expected, owing to the formation of an inert albuminate of mercury. The difficulty may be overcome by adding tartaric acid, four or five times the weight of the corrosive sublimate. In preparing the dressings Dr. Laplace advises the addition of the acid to all corrosive sublimate solutions for antiseptic use.—*Pharmaceutical Era*

Forest and Stream has been publishing a valuable series of articles upon "Snake-bite and its Antidote," by H. C. Yarrow, M. D., Curator in the National Museum at Washington. The experiments have demonstrated a number of things before unknown, and at the same time have shown the inutility of a number of remedies supposed to be infallible, ammonia especially being proved to have no value.

IN THE *Boletin Clinico*, of Lerida, Senor Lorens mentions a case of intra-uterine dentition. He recently attended a woman in humble circumstances in Barcelona during a premature confinement at six months. The child had already cut the four incisors and two lower canines. Had the woman gone full time the dentition would probably have been much further advanced.—*Lancet*.

DR. VOISIN relates the case of a girl eleven years of age, who was a most inveterate and persistent liar, and whom he cured completely of this reprehensible habit by means of hypnotism. Will it not be possible to have a hypnotist present at the next meeting of the ——— Dental Society? It might work a decided modification in the reports of cases from some members.

GERMAN DRUG STORES are apparently rather less trustworthy than American or English, if one may judge of recent revelations. A Berlin society sent out a long series of bogus prescriptions, containing, for example, "tuber cinereum," "urticaria rubra," "pemphigus foliaceus." These things were dispensed and paid for in over sixty Berlin drug stores — *Med. Record*.

THE MEDICAL COLLEGES of the United States turn out annually about 4,000 graduates. This is at least a thousand more than can possibly find employment. What becomes of the surplus?—*Medical Exchange*.

Well, a part of them become poor dentists.

A PHARMACEUTICAL SPECIALTY FOR DENTISTS.

LISTERINE.

Formula.—Listerine is the essential antiseptic compound of Thymol, Eucalyptol, Buphtol, Cadinolol and Menthol, as from thymol. Each fluid ounce contains two grains of refined and purified Benzoboronic Acid.

Dose.—Internally: One teaspoonful three or four times a day (as indicated), either full strength or diluted with water, or in combination with other drugs. As a local application to sores, wounds and abscesses, or as a gargle, mouth wash, inhalant or injection, it can be used ad libitum, diluted as necessary for varied conditions.

Antiseptic, Prophylactic, Deodorant, Non-Toxic, Non-Irritant, Non-Escharotic, Absolutely Safe, Agreeable, Scientific, and Strictly Professional.

LISTERINE is a well-proven antiseptic agent—an antiseptic—especially adapted to internal use and to make and maintain surgical cleanliness—asepsis—in the treatment of all parts of the human body, whether by spray, irrigation, atomization, or simple local application, and therefore characterized by its particular adaptability to the field of preventive medicine—individual prophylaxis.

AND THE REQUIREMENTS OF GENERAL

DENTAL + PRACTICE

LISTERINE IS A

Perfect Tooth and Mouth Wash,

NON-SECRET AND PROFESSIONAL,

And therefore has received the Highest Recognition as the Best General Antiseptic for a

DENTIST'S PRESCRIPTION.

Dentists interested in LISTERINE will please send us their address, and receive by return mail, post-paid, our new and complete pamphlet of 96 quarto pages, embodying

A TABULATED EXHIBIT of the Action of LISTERINE upon inert Voluntary Compounds;

FULL AND EXHAUSTIVE REPORTS and Clinical Observations from all sources, both Medical and Dental, confirming the utility of LISTERINE as a general Antiseptic for both Internal and External use; and particularly

MICROSCOPIC OBSERVATIONS, showing the comparative value and reliability of various Antiseptics in the treatment of Diseases of the Oral Cavity, by W. O. Miller, A. B., Ph. D., D. D. S., Prof. of Operative and Clinical Dentistry, University of Berlin, from whose deductions LISTERINE appears to be the most appropriate prophylactic for the care and preservation of the teeth.

LAMBERT PHARMACAL COMPANY,

116 OLIVE STREET.

ST. LOUIS, MO.

FOR CONSUMPTION AND WASTING DISEASES

HYDROLEINE

(HYDRATED OIL)

Produces Immediate Increase in Flesh and Weight.

FORMULA.

Each Dose of Two Teaspoonfuls equal to 120 Drops, contains :

Pure Cod Liver Oil. 80 m. (drops)	Soda	1-3 Grains.
Distilled Water. 35 "	Salicylic Acid.	1-4 "
Soluble Pancreatin. 5 Grains.	Hyocholec Acid.	1-20 "

DOSE.—Two Teaspoonfuls alone, or with twice the quantity of water, to be taken thrice daily after meals.

HYDROLEINE (Hydrated Oil) is not a simple alkaline emulsion of oleum morrhua, but a hydro-pancreated preparation, containing acids and a modicum of soda. Pancreatin is the digestive principle of fatty foods, and in the soluble form here used, completely saponifies the oleaginous material so necessary to the reparative process in all wasting diseases.

Lautenbach's researches on the functions of the liver would show the beautiful adjustment of therapeutics in preparation of Hydroleine, furnishing, as it does, the acid and soda necessary to prevent self-poisoning by re-absorption of morbid tubercular detritus, and purulent matters into the general circulation.

Each bottle in nutritive value exceeds ten times the same bulk of cod liver oil. It is economical in use and certain in results.

The principles upon which this discovery is based have been described in a treatise on "The Digestion and Assimilation of Fats in the Human Body," by H. C. BARTLETT, Ph. D., F. C. S., and the experiments which were made, together with cases illustrating the effect of Hydrated Oil in practice, are concisely stated in a treatise on "Consumption and Wasting Diseases," by G. OVEREND DREWRY, M. D.

COPIES OF THESE WORKS SENT FREE ON APPLICATION.

Sold at all Drug Stores, at \$1.00 per Bottle.

C. N. CRITTENTON,

SOLE AGENT FOR THE UNITED STATES.

115 FULTON STREET, N. Y.

A Sample of Hydroleine will be sent free upon application, to any physician (enclosing business card) in the United States.

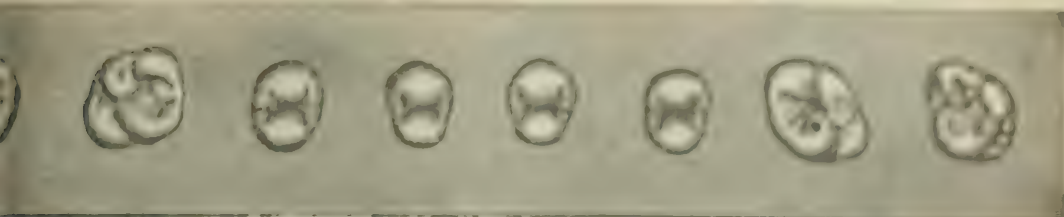
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LID GOLD CUSPS FOR CROWN AND BRIDGE-WORK.

RIGHT

UPPER

LOWER



\$3.50

\$2.50

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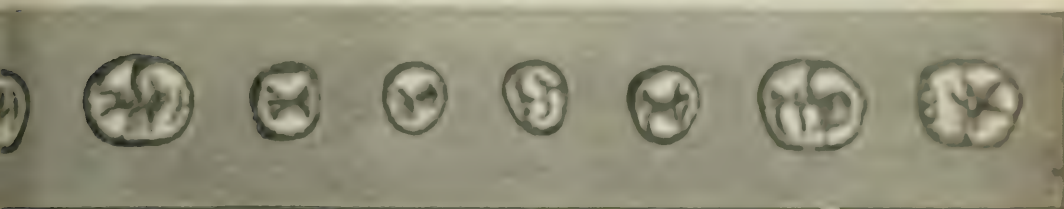
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THICKNESS OF THE GOLD CUSPS.



\$3.50 \$2.50 \$2.00 \$2.00 \$1.00 \$1.00 \$1.00 \$1.00

LEFT

LOWER

RIGHT

These solid Cusps are made of 22-carat gold, and are designed to be soldered to less or other gold bands fitted to the natural teeth, *remain in the mouth*. The cusps are also intended to form the masticating surfaces of porcelain crowns in bridge-work.

PALLADIUM FOR DENTAL AMALGAM

Palladium has been recently brought to notice as forming with three times its weight of mercury a desirable dental amalgam, especially useful in the work of restorations of young patients. We have, therefore, imported a lot of it in order that the profession may be enabled to judge of its utility. Dr. E. A. Dugue, late president of the New York Odontological Society, is reported in the *Dental Cosmos* of September, 1887, page 589, as saying of Palladium:

"It is one of the most important materials for prompt and immediate masticating we can get, and I think it is at the present moment the most valuable filling material with which I am acquainted. Unfortunately, it costs about twenty-five dollars an ounce—much more than gold. It requires to be carefully weighed and more rapidly manipulated. It is used in the form of an amalgam. Those who are unacquainted with her a balance will remember that a certain quantity of mercury is placed in the arm of the balance and a balancing quantity of fillings in the other arm. By using that process for Palladium, we will have about seventy-five per cent. of mercury to twenty-five per cent. of the precipitate, and it will give exactly the proper amount that can be used; hence we may use Palladium at about half or less the cost of gold."

The main objections to it are its hardness and its color. I have found it a valuable material for filling children's teeth and for making amalgam crowns. Fillings will not coalesce as the teeth are again brought together. It is under gold, and it may be made to harden in three seconds to its full strength. Some care is necessary in the mixing, as Palladium forms a true chemical compound with mercury, and the action is so intense that under certain circumstances an explosion may result. Palladium fillings become black, but do not disorder the mouth.

On account of the high cost of Palladium, we have put it up in small quantities, suitable for those who may desire to experiment with it to do so at a small outlay.

Price, Palladium, 1/2 oz. packages

each, @ 4.25

Price, Palladium

per ounce, 25.00

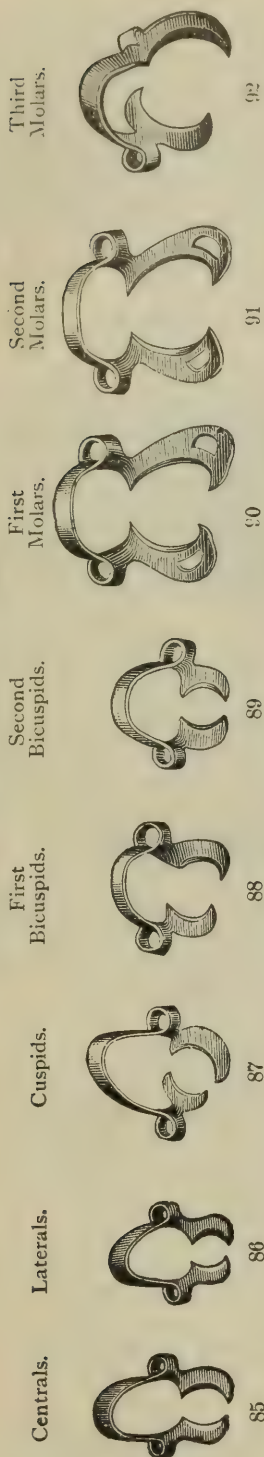
THE S. S. WHITE DENTAL MFG. CO.,
PHILADELPHIA, NEW YORK, BOSTON, CHICAGO, BROOKLYN.

RUBBER DAM CLAMPS

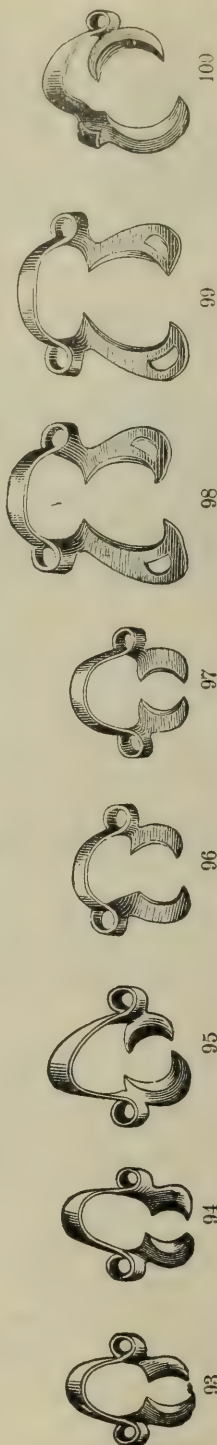
DR. DELOS PALMER'S SET OF 32.

Patented June 22, 1875.

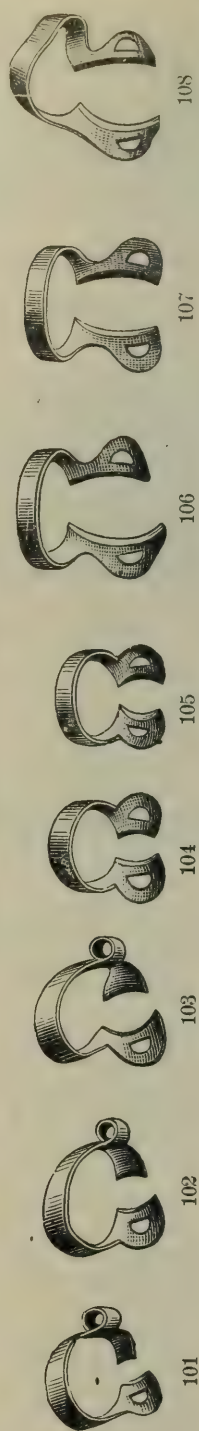
SUPERIOR-Right.



SUPERIOR-Left.



INFERIOR-Right.



INFERIOR-Left.



60 CENTS EACH.

Dr. Palmer's set of thirty-two provides a special clamp for each tooth. The late Dr. M. H. Web writing of Rubber Dam Clamps, said of them: "The most complete, satisfactory and useful, and causing the patient the least pain." Sold separately or in sets (see opposite page).

THE S. S. WHITE DENTAL MFG. CO.,
PHILADELPHIA, NEW YORK, BOSTON, CHICAGO, BROOKLYN

CASE FOR PALMER'S SET OF THIRTY-TWO CLAMPS.



selecting the proper Palmer Clamp without some such device as that employed in the Case which we illustrate, the dentist would be almost as much perplexed as was Van Winkle when he met the dwarfs of the Kaaterskill—they'd all look alike. Here each Clamp has its appropriate little peg, labeled and numbered like the hats in the hat room of the boys' school, selection is easy. The case is mounted, lined with satin and velvet. The pegs are of wood, numbered to correspond with the clamps, and each of the proper size, so that the springs will lift the peg off without exertion or straining the hoop.

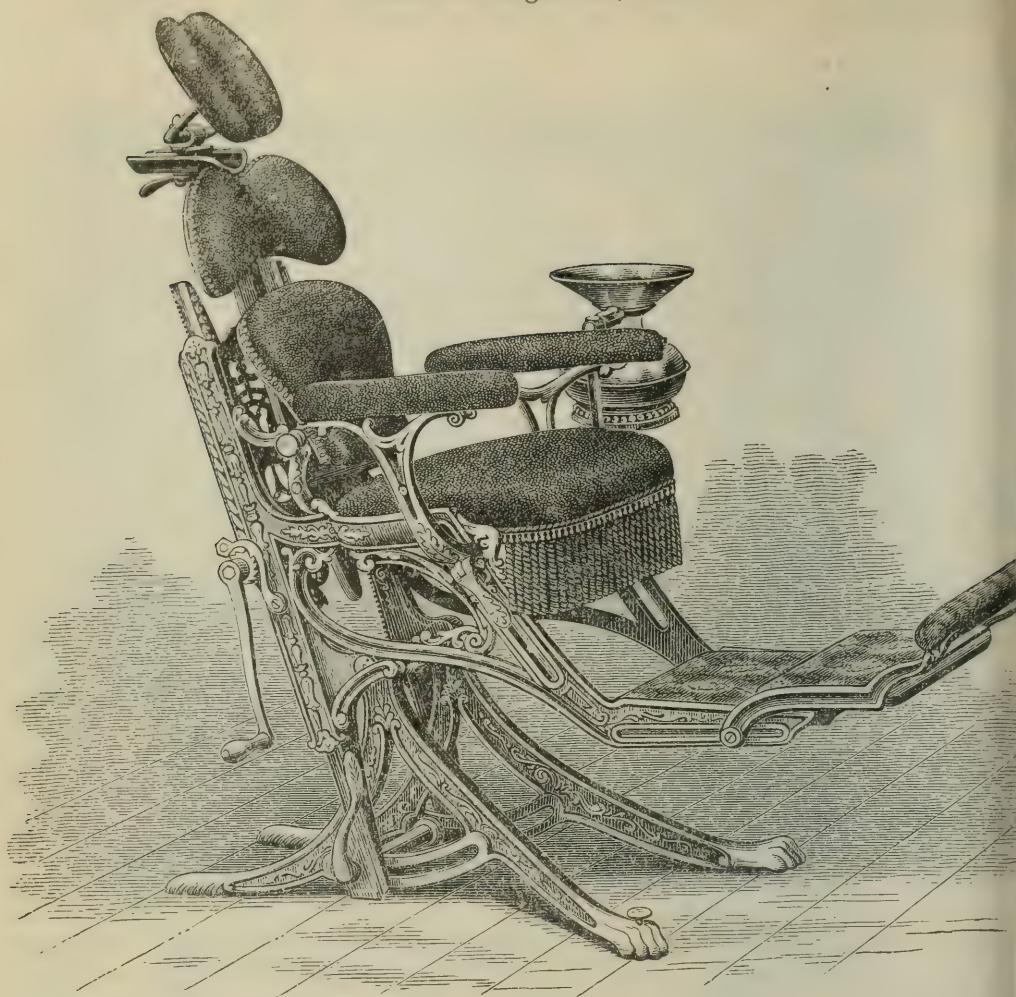
PRICES.

Leather Case, lined with Satin and Velvet \$ 2.50
 Same, with set of Thirty-two Clamps and Palmer's Nickel-plated Forceps. 21.00
 Hardboard Box, containing same arrangement for the Clamps. 1.50
 Same, with set of Thirty-two Clamps and Palmer's Nickel-plated Forceps. 21.00
 Substituting the Universal Clamp Forceps for the Palmer adds 20 cents to the price of the complete set.

THE S. S. WHITE DENTAL MANUF'G CO.
 PHILADELPHIA, NEW YORK, BOSTON, CHICAGO, BROOKLYN.

The Morrison Dental Chair.

Patented August 30, 1887.



PRICES.

- In Best Quality Green or Maroon Plush or Plain Morocco.....\$130
- In Real Morocco, Embossed..... 140
- In Finest Quality Green or Maroon Plush, puffed and trimmed with Plush... 150

The illustration shows No. 4 Spittoon, No. 3 Bracket, and No. 3 Socket, which extras, and add \$8.00 to the above prices.

BOXING FREE.

STUDENT'S MORRISON CHAIR.

To meet an often-expressed want of a first-class chair at a low price, the Student Morrison was brought out. It is, in all respects, equal to the regular Morrison chair except that it is upholstered in a corded material, instead of plush. It presents a very attractive appearance, and will wear nearly as well as plush.

PRICE.

- In Corded Upholstery.....\$100

We supply either style of the Morrison Chair, with or without Casters. When ordered with Casters, the price is \$10.00 extra.

THE S. S. WHITE DENTAL MANUF'G CO.

PHILADELPHIA, NEW YORK, BOSTON, CHICAGO, BROOKLYN.

Balance-Spring for the Morrison Chair.

AN INVALUABLE TILTING DEVICE.

PATENTED SEPT. 20, 1887.



The Morrison Chair has always been popular. Its price, its great range, and its general adaptability have taken it into thousands of dentists' offices. But with all its advantages it has always—until recently—lacked an easy tilting movement. The chair could be tilted—empty without much trouble, but with a patient seated, only with more or less question, as the operator had to control the weight of the patient in addition to that of the chair, when the case was unlocked.

The Balance-Spring Attachment remedies all this and supplies a means of tilting the Morrison Chair in keeping with its other movements. It consists of a strong spiral spring operating a latch which engages with a rod mounted on the flat connecting-bar at the bottom of the movable upright. There is not the slightest interference with the mechanism which locks the chair. Thus, by inclining the chair-body backward, the resistance of the spring counterbalances the weight of the patient, so that the operator has merely to guide the chair to the desired position and lock the case. The frame which supports the spring is made to form a convenient foot-rest for the operator, and whenever it is desired to temporarily dispense with the use of the attachment, all that is necessary is to disengage the latch by pressing the toe piece.

The usefulness of the Balance-Spring Attachment will be best appreciated by those who have had occasion to handle a heavy patient in the Morrison Chair. Its advantages are most apparent when the chair is at its initial height for operating.

It can be applied to any Morrison Chair in a few moments. The frame is made of iron, japanned and gilded.

Price \$12.00

THE S. S. WHITE DENTAL MANUF'G CO.
PHILADELPHIA, NEW YORK, BOSTON, CHICAGO, BROOKLYN.

DENTAL RUBBERS.

In the preparation of rubbers for the use of dentists we have insisted on the same painstaking care in every step that has given our products in other directions the reputation they enjoy. As a consequence, we claim for those which are recognized as being distinctively ours, that they are the best in their various classes.

BOW-SPRING RUBBER.



Of this rubber, when first put upon the market, thirteen years ago, we said :

"This rubber is made of the best Para gum, carefully selected, is thoroughly freed from foreign substances, and is manufactured by improved processes. It contains more gum to the pound than ordinary rubbers,—having less specific gravity,—and is cheaper to the user; first, because it takes more sheets to make a pound; and second, because, being much stronger, it can be made into thinner plates. It will, by reason of its fine texture, receive and retain a high polish. We believe it to be the best gum on the market."

We are still willing to affirm all that we then said concerning this matchless rubber, and we believe that the verdict of the dental profession will sustain us. We feel certain that, were it possible to get a correct statement of the quantity of the different varieties sold during the last twelve years, the Bow-Spring would be found to "lead all the rest." It is still the same high-class rubber it was when first introduced to the profession.

PRICES.

Less than 10 lbs.....	per lb, \$2.75	In 25 lb. lots.....	per lb. \$2.00
In 10 lb. lots.....	" 2.25	In 50 ".....	" 1.80

S. S. White's Dental Gum, No. 1 Improved.

This rubber is of a lower grade than the Bow-Spring, and while it therefore requires less care in vulcanizing, it produces a plate of great strength. It has long been esteemed one of the very best of the cheaper grades, by reason of its easy working qualities, and the satisfactory results achieved with it. It is to-day just as it always was.

PRICES.

Less than 10 lbs.....	per lb. \$2.25	In 25 lb. lots....	per lb. \$1.90
In 10 lb. lots.....	" 2.00	In 50 ".....	" 1.75

The S.S. White Dental Mfg.Co.'s Pink Rubber

The low price which we have put upon our Pink Rubber is in accordance with our rule to give customers their share of any reductions we may be able to make in the cost of production. In desirable qualities for the limited uses to which pink rubber is put—color and toughness—it is equal to the best of the higher-priced brands on the market. Its qualities can be readily tested at slight expense by those who are not familiar with its merits. Put up in half-pound boxes.

Price.....per lb. \$5.00

We also sell leading rubbers of other makers at manufacturers' prices.

THE S. S. WHITE DENTAL MFG. CO.,

Philadelphia, New York, Boston, Chicago, Brooklyn.

TO THE DENTAL PROFESSION:

SEABURY & JOHNSON.

Beg to call attention to the articles manufactured by them especially adapted
 for dental use.

OUR DENTAL LINT

is made with great care, by perfected machinery, of which process WE
ARE THE SOLE OWNERS AND OPERATORS IN THE
COUNTRY, and our product is guaranteed to be better
and lighter than any other make.

OUR DENTAL NAPKINS

Cut from the above LINT, will be found soft and clean, as they rapidly absorb all saliva, blood, mucus and other discharges during operations in the mouth. Their cost is about equal to the expense of washing ordinary napkins.

DENTAL ABSORBENT COTTONS.

Borated, Salicylated, Styptic and all other Medications. Finest quality, highly absorbent, superior to all competitive brands.

RUBBER DAMS, LIGHT AND HEAVY

Order of dealers or directly from us

[illegible]

DR. DARBY'S TOOTHACHE PLASTERS

Which should be a part of the armamentarium of every progressive dentist.

We would also direct your attention to HYDRONAPHTHOL, the new antiseptic and disinfectant. It is colorless, non-poisonous, non-corrosive and tasteless. Is freely soluble in alcohol, ether, benzol, glycerine and fixed oils. twelve times as efficient as carbolic acid and three times as potent as salicylic acid. It is anesthetic and soothing in its local effects. Hence is especially recommended for treating sensitive dental cavities, abscesses, etc. The HYDRONAPHTHOL can be had incorporated in our Absorbent Cotton bandages, Jute, or any desired Surgical Dressing that can be rendered antiseptic.

SEABURY & JOHNSON,

21 Platt Street.

NEW YORK.

Proprietors of the SEABURY PHARMACAL LABORATORIES.

Manufacturers of India Rubber, Pharmaceutical and Surgical Products, Antiseptic Dressings and Absorbents, Bandages, Oiled Silks and Muslins, and

Surgical Drainage of all Diseases

GRO. J. SHADURN, President. J. M. PETERS, Treasurer. ROBERT J. BOWEN, Secretary.

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Use the Best of Everything !

Soft,
Semi-Cohesive,
Extra-Cohesive,



Nos. 819 and 821

FILBERT ST.

PHILADELPHIA.

The attention of the profession is now called to the **only** Gold Foil running **strictly pure** through all the grades. **Soft Gold** is usually produced by alloy, and so with **Extra-Cohesive**. The late Prof. Booth, probably the best analytical chemist of his day, could find no trace of any **alloy** in any of our Gold Foils, after a most exhaustive analysis. These Gold Foils are in regular use by such prominent professional men as Drs. Jack, Essig, Darby, Howe, Lord, Perry, Bogue, Austin & Darby, J. S. March, Requa, Maercklein Brothers, and many others, as well as by the Dental Department of the University of Pennsylvania.

We hope to have every dental depot keep this Foil, but in place of soliciting them, we prefer to have the best professional men try it, and suggest to the depot in their particular locality to keep it in stock, as its **merits** will in this way be recognized.

As it is no more expensive than Gold Foils made by the ordinary processes, we hope to have every dentist who has any preference for a **positively Soft**, a **Medium** grade, or an **excessively Cohesive Foil**, give it a trial by sending an order direct to us. We are able to say that every one who has tried it has continued to use it.

We will forward by mail, without charge for postage, at the following rates :

$\frac{1}{8}$ ounce.....	\$ 4.00
$\frac{1}{2}$ ounce....	15.00
1 ounce.....	30.00

In ordering, make P. O. order or check payable to

MORGAN, HASTINGS & CO.,

7-8-AN-1

PHILADELPHIA, PA.

THE BACKUS MOTOR HAS PROVED A BLESSING TO DENTISTS.

DENTAL MOTORS.

MOTORS SOLD FOR DRIVING LATHES OF
ALL KINDS.

Adapted to run Dental Engines of all descriptions—Morrison's, White's or Suspension. Also for bending, grinding or polishing teeth and all work requiring power in a Dental Office or Laboratory.

The motive power being a minute stream of water (in some cases no larger than a pin head), taken from the house pipe, a pressure of 15 pounds per square inch or upwards gives the necessary power to drive either of the above-named engines at any speed required, from 1,000 to 2,000 revolutions per minute, and is under perfect control of the operator. By a slight touch of the toe on the valve, any speed may instantly be obtained or the motor stopped.

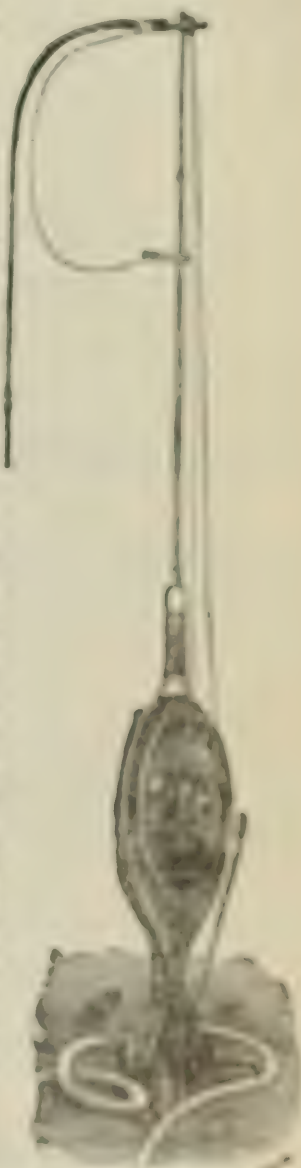
Makes no noise, never leaks or becomes deranged, will run for years with simply oiling, can be moved as easily as the White or Morrison Engine. It is not necessary, however, to have it movable, as the operator does not have to stand by it as in the case where foot power is used.

Dentists who have used these Motors pronounce them the perfection of power for their purpose and say no first-class operator can afford to be without it, as it enables him to accomplish much more work in a day, with greater ease to the patient and less fatigue to himself. Often times it is of very great value to a dentist, and anything that will save time must be a great desideratum.

The Motors are all complete and ready for either pipes or hose as desired; couplings are also furnished with them. They are nicely mounted and ornamented with plated trimmings, finished in every respect, and are very beautiful. Size 12 inches diameter, 21 inches thick by 23 inches in height, weight 11 pounds.

We call your attention to the report of the Committee of the New Jersey Dental Society; also testimonials of prominent dentists who have them in use, to whom we are permitted to refer.

Every Motor, if forwarded, is put up according to directions.



The Backus Motors are used for driving all styles of
Dental Engines.

Send for Special Catalogue to—

BACKUS WATER MOTOR CO.,
NEWARK, N. J.

THE RUSSELL ALLOYS.

Russell's Copper Amalgam.

MORE OF THIS AMALGAM IS SOLD THAN ALL THE OTHER COPPER AMALGAMS TOGETHER. IT IS MADE ENTIRELY BY ELECTRICITY, AND IS ABSOLUTELY CHEMICALLY PURE.

Price \$2.50 per Oz., or 5 Oz. for \$10.

THESE PREPARATIONS ARE MADE IN THE MOST THOROUGH, SCIENTIFIC MANNER.

WE WILL ALLOW 25 CENTS PER OUNCE IN TRADE FOR AMALGAM SCRAP. THIS WE DISSOLVE AND EXTRACT THE SILVER.

SEND STAMP FOR SAMPLE SUFFICIENT TO MAKE SEVERAL FILLINGS.

MANUFACTURED BY

JULIEN W. RUSSELL, M. D. S.,

P. O. Box 81.

BROOKLYN, N. Y.

C. F. FAHRBACH,

214 California Street, SAN FRANCISCO, CALIFORNIA,

GENERAL AGENT FOR THE PACIFIC SLOPE.

THE RUSSELL ALLOYS.

Russell's Alloy No. 1

IS NOW SOLD ALL OVER THE WORLD.

THE DEMAND FOR IT
IS GREATER THAN FOR ANY OTHER.

It is pronounced by all who have used it as the
Most Perfect White Alloy
THAT HAS EVER BEEN MADE.

PRICE.

\$4 PER OUNCE, OR 3 OUNCES FOR \$10.

CLAUDIUS ASH & SONS

LONDON, ENGLAND.

We have established an office for the sale of our

MINERAL TEETH

Dental Rubbers, Forceps, Etc.,

AT

No. 30 East 14th Street,

NEW YORK CITY,

And have in stock a full assortment of

PLAIN TEETH for Metal Plate, and Crown and Bridge Work.

PLAIN TEETH for Rubber Work.

TUBE TEETH for Metal Plate and Pivoting.

Pinless, Dovetail and Open Crown.

PRICES FOR TEETH IN QUANTITIES.

	Small Lots.	\$15 Lots.	\$25 Lots.	\$50 Lots.	\$100 Lots.	
Plate and Rubber.....each,	10	9½	9	8½	8	cents.
Tube.....“	15	14	13½	13	12½	“
Diatoric or Pinless.....“	6	5½	5½	5	4½	“
Dovetailed Bicuspids } and Molars..... }	“ 6	5½	5½	5	4½	“
Pivot.....“	10	9½	9	8½	8	“

The number selected, to make up the value of any of the above lots, may consist of all kinds.

Where satisfactory references are given we shall be pleased to send out a good assortment for *prompt* selection.

C. ASH & SONS' DENTAL RUBBERS

For the last few months the following Pink Dental Rubbers, of our manufacture, have been improved in color and strength, and we have no hesitation in affirming that when they leave the vulcanizer they are a better pink color than any rubber now made. It has ever been our aim to produce an ideal pink rubber, from materials of absolute purity, and we hope by repeated experiments to achieve our purpose. Meanwhile we feel sure it will be generally admitted that the rubbers we are now making, and to which we invite attention, very nearly approach perfection.

No. 1 x.—Color deep pink. For coating.

This rubber is much esteemed for its delicate color and gum-like appearance. It has been before the Profession for more than twenty-five years, and still maintains its high character as a pink rubber. Even as long ago as 1862 it was considered by the Jurors of the International Exhibition held that year, to be of "extreme excellence."

In 2-oz., 4-oz., and $\frac{1}{2}$ -lb. packets, per lb., \$2.00

NEW PINK.—Color deep pink. For coating.

This rubber is soft in the raw state; it can be packed cold if desired; it comes out of the vulcanizer a good pink color, and need not be solarized, should the case be urgently wanted, but, if time will allow, a very beautiful pink can be obtained by exposing the piece to the sun for a few hours.

In 2-oz., 4-oz., and $\frac{1}{2}$ -lb. packets, per lb., \$2.00

OUR NEW

Perfected Modelling Composition per lb., \$1.25

Is the best ever offered the profession.

Excelsior Phosphate Cement per box, \$1.00

Is used and endorsed by many of the most prominent Dentists.

Rogers' Improved Copper Amalgam per oz., \$1.00

Sullivan's " " " 1.00

Jacobs' Gutta Percha Pellets, in two shades, per 10-lb., 1.00

This is the best and most permanent Gutta Percha in the market.

WOLRAB'S GOLD, IMPORTED.

PURE COPPER AMALGAM.

PREPARED BY

GEO. H. WEAGANT, L. D. S.

CORNWALL, ONT.

This Amalgam is not presented to the profession under an assumed or fancy name. It is called Copper Amalgam because it is composed simply of Pure Copper and Mercury. Its superiority is due to the extreme care exercised in its preparation. For filling teeth it possesses many qualities superior to those found in other materials used for this purpose.

It has decided antiseptic properties not found in any other filling material.

It becomes harder than any Amalgam made from alloys.

It is highly recommended for rapidly decaying Wisdom Teeth and for all teeth of a soft, chalky nature.

It is the best filling material for Deciduous Molars.

It is especially adapted for those shallow buccal cavities in lower molars, usually so difficult to manage.

It will not bulge out of the cavity, nor change its shape after it has hardened.

It is absolutely an unshrinking Amalgam.

There is no waste in using this Amalgam, as the smallest scraps can be worked over and used.

It has but one objectionable feature, *it turns black*, but if properly inserted in the cavity, it will not discolor the tooth.

In preparing this Amalgam, great pains are taken to cleanse it from all impurities, making it a perfectly clean Amalgam. The Copper is obtained in a finely divided state by precipitation from a solution of Cupri Sulphas.

Price, \$3.00 per Ounce.

E. E. WEAGANT, D. D. S., Potsdam, N. Y.,

GENERAL AGENT FOR THE U. S.

12-7-00-1/2

THE WALTHAM CORUNDUM WHEEL FOR DRY GRINDING.

MANUFACTURED BY

WALTHAM EMERY WHEEL CO.,

WALTHAM, MASS.

These wheels were first brought to the attention of the dental profession by DR. HORATIO C. MERIAM, OF HARVARD UNIVERSITY, and were used by him in his clinic at the International Medical Congress. At the annual meeting of the Massachusetts Dental Society, a committee was appointed to secure their being placed before the profession.

As they grind porcelain without the use of water, they can be used by Dentists at the Chair without spattering or soiling their office coats. They cut much faster, and being indestructible by water, acids or heat, are more durable than the ordinary Corundum Wheel, and will accomplish more than double the amount of work. They can be used with water if desired.

The points were made for Dr. Meriam for his experiments in reaming the holes in porcelain teeth, and they may be used for this purpose in the Ash Tube Teeth, Bonwill, Foster Crowns, &c. See article in DENTAL COSMOS of August, 1886.

FOR SALE AT THE DENTAL DEPOTS.

2-8-AN-4.



Fig 1.



Fig 2.



Fig 3.



Fig 4.



Fig 5.



Fig 6.



Fig 7.



Fig 8.



Fig. 9.

THE Independent Practitioner.

VOL. IX.

AUGUST, 1888.

No. 8.

NOTE.—No paper published or to be published in another journal will be accepted for this department. All papers must be in the hands of the Editor before the first day of the month preceding that in which they are expected to appear. Extra copies will be furnished to each contributor of an accepted original article, and requests, in proper form, may be laid at the cost of the paper, press work and binding, if ordered when the manuscript is forwarded. The Editor and Publishers are not responsible for the opinions expressed by contributors. The Journal is issued promptly, on the first day of each month.

Original Communications.

CHROMOGENIC BACTERIA OF THE HUMAN MOUTH.—THEIR RELATION TO THE DIFFERENT COLORS OF DECAYED DENTINE.

BY PROF. W. D. MILLER, BERLIN, GERMANY.

I need scarcely remark that many theories have been proposed to account for the various colors presented by decayed dentine. The best known is that of Watt, which attributes these colors to the action of various mineral acids, supposed to be concerned in the production of caries. Another view assigns the chief role to articles of food, drink, etc., which do certainly sometimes produce discoloration of the decayed as well as of the healthy tooth tissue. A third would have us believe that the color comes from within, and is one of the results of the vital action of the tooth itself. A fourth theory would hold the chromogenic bacteria: *micrococcus prodigiosus*, etc., accountable for the various colors found.

Chromogenic bacteria are found by no means seldom in the human mouth; being widely distributed in nature it naturally happens that they find their way into the oral cavity. A plate of gelatine exposed to impure air for a short time almost invariably develops one or more colored colonies; green, various shades of yellow, brown, and red, often being represented on one plate.

As a rule, the colorless bacteria predominate in the human mouth to such an extent that the chromogenic bacteria, if present, cannot be detected; occasionally, however, they may be easily recognized even by the naked eye. I have observed a brick-red color more frequently than any other, on the lingual surface of the lower front teeth and on the buccal surface of the molar teeth. A culture of this bacterium is seen in fig. 3¹. The cultivation succeeds with considerable difficulty, and I have been able only once to obtain a pure growth from the deposit taken from the teeth.

A number of times I have found cavities of decay, usually dark brown, in which the surface of the dentine was colored with a bright yellow mass of cheesy consistency. I have not been able to obtain a pure culture of this bacterium on gelatine, though I have repeatedly observed a slight growth on potatoes.

Any one who will keep a lookout for the two appearances just described will certainly see them. A case which was interesting in more than one respect occurred at the polyclinic of the Dental Institute at Berlin, a few weeks ago. A man presented himself, having a swelling on the right side of the face, almost as large as a man's fist, connected with the inferior wisdom-tooth (impeded eruption). The larger portion of the surface of the mouth and tongue was covered with a canary yellow deposit, which could not be accounted for by anything that the patient had taken into his mouth.

I found a bacillus in the pus which was evacuated upon the extraction of the tooth, and also in the yellow layer upon the surface of the cheeks and gums, which reproduced the same color in pure cultures and besides showed considerable pathogenic action. I had no opportunity to see the patient again, consequently do not know the result of the infection. A pure culture of this micro-organism on gelatine is seen in fig. 4 of the plate.

¹ See lithographic plate.

I have found in the human mouth and isolated no less than eight different kinds of bacteria which produce a yellow pigment, not including the well-known yellow staphylococcus. These bacteria are themselves yellow, but do not impart any color to the culture medium.

I have made a great many attempts to cultivate the supposed bacterium of greenstain, but so far without success. I have indeed isolated five different bacteria from the mouth which impart a green color to the culture media, although themselves colorless, and all of which grow well on the usual media, but I do not bring any of them into causal connection with the greenstain, since, so far as my observation goes, the bacterium of greenstain, if there be such a thing, does not grow on gelatine. I found one of these in the contents of an alveolar abscess; it grew with tolerable rapidity, liquefying the gelatine (see fig. 1). If cultivated without the presence of oxygen no color is developed, but if the culture is shaken with air, it will, in a few seconds, assume a beautiful green color. I found the second in a cavity of decay, and the other three in my search for the supposed bacterium of pyorrhea alveolaris; they are colorless, but impart a beautiful opalescent color to the gelatine, one of them having, at the beginning, a decidedly bluish tinge. A pure culture of one of these is seen in fig. 2. It is, however, impossible to reproduce the opalescent character in the figure. The cultures of one bacterium obtained from the mouth have a red color on the surface, but are colorless beneath the surface (fig. 3); the protoplasm of the living cells contains the coloring matter, and no color is imparted to the gelatine. Another has a reddish color also confined to the bacteria themselves. Cultures of still another have a decided brownish color (fig. 5). It liquefies the gelatine, and sinks to the bottom as a brownish irregular mass.

I shall not enter into a discussion of the biology of these bacteria. At present we are interested in the question as to what part they may take, if any, in the production of the various colors or shades of color in carious dentine. I stated my view as to the part played by chromogenic fungi in pigmenting carious dentine in the INDEPENDENT PRACTITIONER for 1884. If the question is asked whether any of the many chromogenic bacteria referred to in the article are concerned in the process, we must answer no; at least not more than the many other bacteria in the human

mouth. The green-producing bacteria, which I have named *Bacteria viridantia*, are excluded, because green dentine does not occur. Those which assume a yellow color (*Bacteria fluorescentia*) cannot be looked upon as the direct cause of the yellow shade of carious dentine, because the color is confined to the micro-organisms themselves, the medium on which they are cultivated becoming very little if at all stained. In the case of dentine, the relations are exactly the opposite; the dentine becomes stained while the micro-organisms remain colorless (white). This is probably well known to those who made a few sections of carious dentine. The coloring of carious dentine is, in my opinion, explained in an altogether different manner. The following description, the different parts of which are illustrated in figs. 6-9 inclusive, was taken from actual experiments. I inoculated a tube of culture gelatine with a bacterium obtained from carious dentine; almost any bacterium which liquefies the gelatine would, however, have served the same purpose. In about two weeks the gelatine was completely melted and a white mass of bacteria lay on the bottom of the tube.

At the beginning of the experiment the gelatine had only the slight yellowish tinge often present in culture gelatine (see fig. 6); gradually, however, a brownish color made its appearance, giving the tube, at the end of four weeks, the color seen in fig. 7. After ten weeks it appeared as in fig. 8, the color gradually growing darker, long after all the bacteria were dead. An old dry culture, 6-8 months old, presented the color of fig. 9, or about that of the black spots (so called caries nigra) often seen on the approximal surfaces of teeth where caries once began and then ceased after the removal of the approximating tooth. Organic matter undergoing decomposition assumes, as is well known, a dark color, and the same is true of decaying dentine. The colors characteristic of decaying dentine do not exist in the very beginning of the decay, but appear subsequently. The more recent or acute the decay the less the discoloration; the older or more chronic the decay the deeper the color.

There is, however, another factor which may play a part in the discoloration of dentine, more particularly in those that contain dead pulps; the latter sometimes become intensely black, and it is to these in particular that the following suggestion refers. My

attention has been recently called to the fact that iron had by recent experiments been found in a variety of tissues where it had not previously been detected. This discovery led to the thought that iron might be present in the dental pulp, and that in such case the black color of putrid pulps might be accounted for by the formation of the sulphide of iron. I made a few preliminary experiments relating to this question, the results of which I here give. The tests were made in the following manner. A tooth was cracked in a porcelain mortar, so as to thoroughly expose the pulp, and then placed in a mixture of dilute hydrochloric acid, to which was added a small proportion of a 10 per cent. solution of ferro-cyanide of potassium. The hydrochloric acid, as well as the water used for diluting it, must be free from iron. Neither must any iron instrument be brought in contact with the freshly broken surfaces of the tooth. Those parts of the tooth containing iron, even in minute quantities, will, after an exposure of from one to sixty minutes, assume a blue color—Prussian blue being formed. One source of error is introduced in the necessary use of an iron instrument in extracting the tooth, but this will only affect those points on the external surface of the tooth with which the forceps come in contact, and may therefore be easily eliminated.

I have found iron 1) constantly in Nasmyth's membrane (probably only as a deposit from external sources); 2) in the dental pulp, though not constantly; 3) in carious dentine almost constantly, sometimes a bright blue line forming on the border between the decalcified and normal tissue, a rather remarkable appearance for which I can, at present, attempt no explanation; 4) in enamel, particularly around the margin of cavities of decay, also sometimes in decalcified enamel.¹

It seems, consequently, not impossible that the sulphide of iron which would be formed during putrefaction of the pulp may have something to do with the discoloration of the same. Whether sulphide of iron may be formed through decay of the dentine or enamel in sufficient quantity to aid in discoloring the same, I cannot say; at present I doubt it. Further experiments may furnish an answer to this question.

¹ Traces of iron have been detected (as is well known) in chemical analysis in both dentine and enamel.

THE TREND OF DENTAL THERAPEUSIS.

BY W. XAVIER SUDDUTH, M. D., D. D. S., F. R. M. S.

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The prevention of disease is the goal to which medicine looks forward. We have not, as yet, attained the desired end, nevertheless we should not despise the grand strides made in that direction during the past decade. The ravages of many of the infectious diseases have been abated. For the first time in the history of nations has that dread scourge, cholera, been headed off in its western course from its birthplace, in India, and so held in check by better hygienic conditions as not to be very greatly feared, even in the provinces where it prevails as a mild epidemic. Typhoid fever is another example of how science has been able to hold in check a most dreaded disease that was formerly said to be epidemic but which has been proven to be of local origin. It is now known to be contagious only by actual contact, and not infectious in the sense in which that term is generally used by the profession. These advances in the prevention of general systemic diseases have been more than equalled in the progress made in the line of antiseptic surgery and the prevention of infection through other channels; more especially in puerperal or child-bed fever. These changes have been brought about in medicine through the researches in mycology, whereby the etiology of the various diseases has been made known. Given the known cause of disease and its prevention, in many instances, becomes a more or less simple matter. But before these stages of progress were attained, medicine passed through the quagmires of empiricism and doubt, and in many diseases even yet all we can do is to treat the symptoms. In fact, a school of medicine exists that depends entirely upon symptomology for its *pathology* and indications for treatment. The history of dentistry is very similar to that of medicine. It is to-day just stepping out of the "slough of despond" into the light of a more exact science. If we go back over dental literature we will find many queer ideas, queer in the light of our present knowl-

edge, which were presented and taught in our dental colleges. A student's note-book of ten years ago would look very antiquated if published at the present time.

Who has not had this or that grandparent held up to him as an example because he or she lived on the crusts instead of the good soft part of the bread? Who does not remember such sayings as the following: "We are a nation that live on spiced vitals, hence our teeth decay," "Nature preserves only those organs that are of daily use," "Bandage your arm to your side and it will wither," and such like comparisons, putting the teeth on the same line of vitality as the other parts of the body. How long is it since the "vital theory" of decay received its death blow? This theory held sway for many years, and sprung into existence as a result of hard study on the etiology of decay, but its promulgators were handicapped because they did not have the additional light of the cognate sciences as revealed at the present day. It has long been known that decay was the result of acids, but when we tried to produce decay out of the mouth we could not get the same results as in the mouth, hence it was said that a tooth out of the mouth was a dead tooth, and consequently the conditions were not the same. The natural inference was that the vitality of the living tooth modified the action of the acids in the production of decay. For many years it was held that putrefaction was the cause of decay, and out of this belief grew several lines of practice, some of which are followed to the present day.

Arthur and his adherents proposed to prevent decay by creating "self-cleansing surfaces," by wide separations. This most objectionable practice is, I am happy to say, fast passing into disrepute. It has always been a mystery to me how any man with any knowledge of the histology of tooth structure could, for a moment, think that it was possible to improve on nature as to the form of the teeth. Others proposed wholesale extraction of bicuspids and first molars. The sad plight in which the patient was left by reason of the breaking up of the articulation, however, deterred many from practicing this form of mutilation. Still others proposed contour fillings—restoration as near to nature as possible, and which was much more successful, in that, tooth surface was not allowed to touch opposing tooth surface. These all, however, belong to the class of mechanical therapeutics.

As an adjunct to therapeutics very good but as a dependence, sure failure in the end, because it is trying to remove the tooth from the cause rather than the cause from the tooth. All these theories had some basis in fact. The crust our grandmothers ate required considerable mastication, which stimulated a free flow of saliva and consequent dilution of the acids of the mouth. The same is accomplished by chewing tobacco, or gum, or even a toothpick.

The universal acid theory, more in consonance with the appearances, but no more correct as regards its application, has been largely disproven. The putrefactive theory has been entirely abandoned since it has been found that teeth may be placed in putrefying mixtures, and allowed to remain for years without the least trace of decay being produced so long as fermentation did not occur.

In late years, however, much light has been thrown upon the real nature of decay by Drs. Miller, Black and some others, including myself. There is another factor at work in the destruction of the tooth besides acid decalcification. The acid can only remove the lime salts. The form of the tooth at least, in so far as the dentine and cement are concerned, remains intact, and being largely organic, some other agent is required for its disintegration. Dr. Miller has demonstrated that the carious fungus develops an inverting ferment which has the power, after the tooth has undergone decalcification, of dissolving the basis substance. These researches of Dr. Miller gave the final blow to the mineral acid theory, and settled the question of the etiology of decay.

While it must be generally admitted that an acid condition of the fluids of the mouth may have a tendency to cause erosion at the gingival margin, or that inflammatory tissues which come in contact with the teeth, as I have so many times pointed out in previous papers, and the secretion of buccal or labial glands, as demonstrated by Dr. Kirk, may and do produce decay, yet by far the greater majority of carious conditions, being localized points of decay, are the result of local agents developed by micro-organisms at the point where the tooth substance is lost. To Dr. Miller belongs the credit of isolating several of these acid producing fungi and determining the particular acid, and also the investing agent produced by them. It has been argued by some that Leber and Rottenstein preceded Dr. Miller in this line of work, while it is true that they and

Magritot as well had worked in the same direction, yet it is also true that they failed to positively prove their positions by isolating the special micro-organism that caused decay. Dr. Miller not only isolated the fungus, but determined the acid developed by it, and produced decay out of the mouth by the direct action of these special organisms that cannot be detected from "natural" decay occurring in the mouth.

I would not detract an iota from the credit due for the work they did, nor do I say that their work, which was in the right direction, did not help Dr. Miller in his researches. I was working on this subject at the same time as Dr. Miller, and made my report to the Illinois State Society in May, 1884. I discovered what Dr. Miller subsequently published, that the micro-organisms, while thickly distributed in the semi-decalcified dentine, did not penetrate the sound, healthy dentine. That was work in the right direction also, but I did not determine the character of the fungus as did Dr. Miller, so I say honor to whom honor is due, and I hope, when Dr. Miller shall visit this country this summer, to see the dental profession give him such an ovation as was never given to any other dentist in this country before. The profession owes it to him, for he has solved the problem of dental caries and has made it possible to formulate an exact line of dental therapeutics that will do more in the end to help reach that desired position, where we can anticipate decay, than all the combined efforts of the profession before him. Having the known etiology of a disease we are in better condition to treat it antiphlogistically. The question naturally arises, how shall we best restore the parts to a better hygienic condition, taking for granted that caries is the result of an unhygienic condition? The answer comes, keep the mouth clean. But the word cleanliness has largely increased its meaning, since so much has been done in the direction of bacteriology.

Formerly everything was clean that we did not know was dirty, now everything is dirty that we do not know to be microscopically clean. The microscope and bacteriological apparatus have been placed side by side with chemical reagents, etoect and soles. A mouth may look ever so clean and yet be most foul when judged from our present standard of cleanliness. Dirt is only a matter of comparison. The best definition I ever heard for it was "matter in the wrong place." The soil in the field is all right, but on "my

lady's fingers" all wrong, and so it is with micro-organisms; they have their place in nature, or they would not be there, but the mouth is not that place, and when so found they put that cavity in a decidedly unhygienic condition, and it is with such a condition that we propose to deal.

We will first consider how micro-organisms operate deleteriously upon the teeth. I remember a paper that was read by a New York dentist, on the etiology of decay, in 1882, in which he took the ground that these fungi lived upon the lime salts of the teeth, and that instances were on record where teeth had been found honey-combed by their action. This theory has been thoroughly disproven, and it is now positively known that several of the fungi that find a suitable culture media in the oral fluids have the power of producing lactic acid. The *Bacillus acidi lactici* has long been known to mycologists. Its physiology and morphology have been fully studied in its relation to the souring of milk. It grows in rods of varying lengths, generally from 1—2.8 mm. long, although sometimes found in long mycelial threads. It is from .3—.4 mm. thick—the thickness varies, being thinnest when cultivated upon nutrient gelatine. It does not produce cocci, but forms spores, and grows best at a temperature 39c.—42c. At a temperature exceeding 45.5c. they are no longer capable of producing any activity. It is probable that several forms of micro-organisms have the power of souring milk.

Dr. Miller thinks, however, that they all belong to the same genera, and that the variation is due to the change in conditions under which they are developed. It is possible that he is right in the matter. He has determined several forms in the mouth that have the power of producing lactic acid, and considers them variations of the same fungus. My studies have led me to the conclusion that not much dependence can be put in mere form alone; we must combine our researches to the physiological action of cells, whether they be of a low or high grade in the scale of existence.

Of the particular species of fungus that produces decay, according to Dr. Miller, the fungus presents as cocci, diplococci and as pronounced bacteria. The variations are so great that unless seen in one chain, as he has often done, he could hardly have believed that they belonged to the same genera. The variations in form account for the presence of the different shaped micro-organisms found in

the expanded dentinal canals. Dr. Miller thinks, however, that another genera might be differentiated that presents itself as a bacillus in most instances, but which is also found in the form of *Leptothrix*, bacteria and cocci; either singly or in zigzag threads. Miller has denominated these two forms as α and β —*Alpha fungus*, *Beta fungus*—and has positively shown that they are both connected with the production of lactic acid.

I am inclined to consider these fungi as different forms of the bacterium which is most commonly found in sour milk—although not altogether agreeing with the description presented by Pasteur. The question as to form and genera is one of minor importance, however. They all act in a similar manner by converting sugar into lactic acid. It does not matter whether the sugar be cane or grape.

A new sugar, saccharine, has been lately discovered that is said to be absolutely non-fermentable, which may in time come to supplant glucose that is now so largely used in the adulterations of our confections. Lactic acid is also produced in the mouth by granulation tissue. Acetic acid and formic acid are also produced by the oxidation of alcohol. The latter, however, in very small quantities, and it is a question whether the generally acid condition of the saliva has any very great decalcifying action on the teeth. I am certain that decay is a local disease, and that the agent is produced at the point of decay in the great majority of cases. Eruptions are produced in most instances, however, by the generally acid condition of the saliva. Believing then, as I do, that fully nine-tenths of the decay found in the mouth is caused by a fungus that has its habitat in the oral fluids, it is not strange that I should advocate antiseptic rather than neutralizing agents. Alkalies have only an ephemeral action at best, and are known to have an injurious action on temporary fillings. The most commonly applicable agent is one that will strike at the root of the evil, and by destroying the active agent eliminate decay. This is not always found practicable, however, and in many instances we must content ourselves with preventing the development of the micro-organisms that produce decay.

Dr. Miller did considerable work in the direction of determining the antiseptic value of a long list of drugs, Miller's list included: Bichloride of mercury, Nitrate of silver, Iodoform, Naphthaline, Iodine, Oil of mustard, Potassium permanganate of Pot., Eucalyptus oil,

Carbolic acid, Hydrochloric acid, Phenyl acid, Carbonate of sodium, Salicylic acid, Alcohol.

To these I have added the following, and present to you for examination: Hydronaphthol, Beta Naphthol, Naphthalin, Antiseptic pastiles, Soziodol, Zinc soziodol, Sodæ soziodol, Potass. soziodol, Murcuric soziodol, Saccharine, Salol, Silico flouride of Soda, Silico flouride of Zinc and Soda, Salicylate of Zinc, Benzoated sol. aluminium, Liquor carbonic detergent, Labarraque's sol. Boroglyceride, Styrene, Trichlorphenol, Resorsin, Thymol, Subiodide of Bismuth, Boric acid, Aluminium Acitotratium, Iodol, Borate of Zinc, Chloride of Zinc, Hydrochinine, Permanganate of Zinc, Benzoic acid, Creosote, Aseptol, Sulphocorbolate of Zinc, Peroxide of Hydrogen.

It is my intention to test all these agents, first in the laboratory and then in the mouth, and if possible determine their exact antiseptic value. I shall include in my experiments, also, all the different forms of tooth washes that are on the market and report to the profession at some future date.

PAST AND PRESENT TEACHINGS IN THE USE OF GOLD FOIL.

BY PROF. JAMES TRUMAN.

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The peculiar characteristics of gold foil are now so well understood that it would be a work of supererogation to attempt to instruct any body of this kind, and I do not propose to attempt it. Yet there are points that must be alluded to in order that the subject may be made clear.

If I were to define soft foil, I would say it is that form of foil that has a minimum amount of cohesiveness, and that this cohesiveness cannot be increased by heat. The definition I would give to cohesive foil would be: That form of gold which, freshly prepared, will cohere without force, and at all times may have that quality increased in degree by heat. Each of these forms find their best

examples in the open market. I know of but two strictly non-cohesive foils. There may be others, but I am not familiar with them. There are many that simulate strictly non-cohesive foils, and probably answer all the purposes served by them; but they do not answer to the definition as I have given it. It was the strictly soft foil with which the profession began its work and for, at least, a half a century, prior to 1855, did with it all the work that was done in the stopping of cavities. It was at this period, 1828, that Dr. Arthur introduced the cohesive variety of foil, and thus the century has been nearly equally divided on the two prominent forms of foil, with the result that the profession has less positiveness in its opinions to-day on the subject, of the proper method of filling teeth, than at any time since the beginning of the century. This is all the more remarkable when it is considered that the last thirty years have developed the best operators and the most intelligent system of dentistry the world has ever seen. What is equally remarkable is, that the profession, as such, has quietly settled down and written *finished* over the temple of their construction and look askant at any one who suggests the possibility that no temple of human construction can be regarded as ever complete, but must be continually subject to repairs and remodelling. This probably arises from what appears to be a law of mind, that everything seems to move in circles and in its revolution reaches ebb and flow, low tide of interest in any special work, and then the full flood. This has been most markedly manifest in many phases of dentistry, notably in that of the mechanical branch. Forty years ago this was at the flood. Nothing was thought of but the proper way to make plates. Then in the process of revolution came the flood tide for fillings and the ebb in mechanics. Now it is flood with scientific dentistry and decidedly ebb with fillings, and prosthetic dentistry is surging to the surface and high water again with its bridge work and crowns. We have nearly reached solid rock with stoppings, and, it seems to me, if there is not more attention given to this subject in journals and conventions, we are doomed to a retrogression in the filling of teeth. It, indeed, the time does not come when it will be classed with Phillipe's lost arts. There is a law always operating that stagnation means death. It is true of mental development and equally true of all forms of active human effort. That the filling of teeth has received no attention in recent years

can only be accounted for by the fact that interest has been measurably lost, and it behooves us to inquire whether this lack of interest does not mean not only death to skill in the handling of gold, but that it points unerringly to the near future when thoroughly good operators will be as scarce as they were in 1840, when the ten digits would more than compass the number in this country. Some will doubtless regard this as the pessimistic thought of one who has measurably left the current of active interest in this direction, and sees only through a glass darkly. But while this is to some extent true it is impossible to avoid the reflection that effects are always, or at least, should be traceable to a cause, and if the cause contains within itself the germs of imperfection, it requires no prophet to outline future results.

The operations with soft foil were based solely on certain principles, not difficult to master in theory, but exceedingly difficult to put in practice. It was not surprising, therefore, that while all, perhaps, could theoretically explain what was meant by a good soft foil filling, there were but few equal to the details as then understood. These details began primarily with the formation of the cavity, and the prognosis in every case must take in the density, thickness of walls, and position of every tooth. No general law of formation was or could be formulated. Each cavity was a law unto itself, and hence the teachers of forty years ago in operative dentistry were, perforce, compelled to train the minds of the students, not in general principles to be worked out in detail, but in details to the entire negation of nearly all general principles of procedure. When Prof. Elisha Townsend, the most finished operator of his day, found it necessary to spend nearly the entire session on cavities of all forms and the possible modes of preparation, he simply adopted the best and only reasonable mode of teaching, for each had to be studied as a separate entity. In this way many of us were trained, and when Harris explained his mode in a similar way in his "Principles and Practice of Dental Surgery," the dental world regarded the work of filling teeth as practically completed, and that no better forms of instruction could be devised. But even with this character of gold new forms of more convenient shape were prepared at a later day; but while these aided in the operation the general modes of formation of cavities remained the same. While the processes in use with non-cohesive foil were very similar,

that of Prof. Townsend came nearer modern cohesive foil methods, inasmuch as he inserted his gold in small pieces, and practically built up the filling lamina by lamina. But this was not the general method. It was regarded by the average operator as slow and tedious, and only adapted to one who could charge fabulous prices from the millionaires of the period.

The method then in vogue might be appropriately called "stuffing" the cavity, a method at once uncertain and often dangerous to the tooth from the lateral force, necessarily exerted in the condensation of the filling. Notwithstanding this and other difficulties it is not surprising that results were often more satisfactory than present modes, for the perfect adaptation of the soft foil to the walls prevented imbibition of fluids at the most vulnerable point, and the enamel was not "erased" by the blows—a thousand is none to the minute—of electric and mechanical mallets.

But in whatever light we may view the teaching and the practice of this period, it must be regarded at once imperfect and wholly without system. Teaching to be effective must first be based on a method capable of being reduced to law, and then the law should be formulated and closely adhered to. No positive law could be formulated with soft gold, and hence students were a law unto themselves. That the influence of this method has reached our day no one can deny; indeed its power is beginning to be so strongly felt that it threatens to overwhelm the work of the last quarter of a century, if it does not eventually sink all the science of filling teeth evolved during that period.

The second period was, as I before remarked, ushered in by Dr. Arthur. This has been a remarkable epoch in this special work. To some of us who recall the beginnings, the slow approaches made to any satisfactory use of cohesive foil, the tedious upbuilding of means and processes, the manufacture of appliances, all, as we think them over, savor of the marvellous; but they are all pre-eminently in harmony with the wonderful creations of this waning century. The introducer of cohesive foil never anticipated the remarkable results lying dormant in the "sticky foil" he presented as a possible aid in dental operations, and the dentist of the time, equally oblivious, struggled with its clogging, and manfully tried to evolve something out of its intractable crystals. This was cohesive foil in 1855. It was not long, however, before chance yielded to

system, but this was the result of the working of many minds and many nimble fingers. Hours, days, weeks and years of thought were devoted to perfecting this process. First came the necessity for a proper form of cavity. Then it was manifest that something more than the old anchorages, simply places scooped out in the dentine, were necessary. This cohesive gold must be started right. It must be solid from the foundation, and this must not be left to chance. This led to the formation of bolt-like holes drilled into the tissue, which, when filled, served not only as an anchorage, but as a point to build from. This form of anchorage was, I believe, first taught by myself; at least it was original in my teaching, and the first published paper describing it was inserted in the Dental Times, July, 1865. It met with positive opposition as well as favor; but I have never been able to discover any serious objection to it to this day. Gradually the system became more and more perfectly developed, until the introduction of mallet force, which effected a radical change. This was still further increased by the multiplication of force in mechanical mallets, and then came the gradual and systematic perfection of this mode of condensation. From the introduction of cohesive foil until the final consummation which brings us down nearly to the present period, there has been a system of filling perfected with it, without perceptible flaw in its arrangement, capable of meeting all emergencies, adapted to the frailest of teeth, and capable of being taught to the dullest comprehension. The result has been better operators, and work that has stood the test of attrition and time more satisfactorily than the old mode. Whether this be acceded to or not, I claim for it that it is the only system worthy to be dignified by that title. It has defects and one of these I have already hinted at and more elaborately stated in my paper on "Rotation as a Condensing Force," read before the Odontological Society of this city. The mode of using this foil is too familiar to you to risk your patience by repeating. My effort now is to arrive at some definite conclusions in regard to these two methods and their relative value as systems of practice.

The cohesive foil method, perfect as it is as a system of filling, has met with opposition; indeed that opposition began with its introduction and has grown in strength, until at this time dentists are divided into many schools of practice. The first positive blow was struck by the, so called, New Departurist, and whatever

may be said derogatory to their methods and modes of procedure, this much must be accorded them that they led the way in a revolution that now threatens to sap the very foundations of gold filling as it has heretofore been understood, and promises to land us in a chaos of conflicting ideas and practices from which it may take years to recover.

The two positive schools, in the use of gold, are composed of those who regard the first form, soft foil, as the only true method, and those who still adhere to the cohesive with its perfect system.

While I have nothing but admiration for the latter, as a system, I am not wholly in love with it as a method of preservation of tooth structure. The best years of my life were given to its perfection, and it may be said without egotism, that as professor of operative dentistry in the Pennsylvania College of Dental Surgery, I did my part to make it a positive practice, and helped to send forth an army of young men well equipped for service, and the work has made its mark on this generation. While all this is felt there are some weak points in the system that have driven many men to the adoption of a middle course, in the use of a combination of soft and cohesive foils. The use of this combination is based, 1) On rapidity of execution. 2) Adaptation of soft foil to the walls. 3) A solidity which, if not equal to cohesive alone, meets all the requirements of a good filling. When this mode is confined within certain limits, that is, as a lining to the walls and cervical border, no serious objection can be urged; indeed it is a question whether it is not the best mode of filling, as it is the quickest. When rotation (Herbst's method) is applied to the adaptation of the soft foil, no better results can be obtained, I think, by the mechanical mallet, although it gives greater density. This, to my mind, is the most practical mode of filling teeth. I do not say that it is the most perfect mode, if solidity be the test of perfection; but in the saving of time, money to our patients, and with satisfactory results, it must be regarded, while not new, certainly the most available and practical method.

But we have other uses for fillings beside that of satisfying our strength and our patients' pockets. The filling of teeth has to be taught. It is a prominent subject in the curriculum of our colleges. It is made, in connection with mechanical dentistry, the basis of

the superstructure which has been in course of construction from the time of the fathers, and will continue unfinished through many generations. Is then the first method, which I have attempted to generalize, or the last the proper mode to train either students in our offices or in our colleges? I have no hesitation in answering this, as regards both, in the negative. We should, if I view the matter correctly, start with the simplest idea, and carry it to its complications. We should begin with the conception of, perhaps, the lowest form of mechanical force—the bolt—and aspire to complexity when the mind has been trained through regular gradations. The student of all periods is necessarily a one idea man, and he must be approached upon that principle, gradually enlarging thought, and by thus enlarging we assist him to grasp more easily other ideas and modes of procedure. This will enable him to master without difficulty all forms of gold work, whether it has entered into his teaching or not. This must be regarded as a truism; but it is lost sight of in a measurable degree in the effort to jump the foundation. We cannot build houses in the air, and we cannot make dentists unless we train their hands and place in their minds systematized thought. The adoption of cohesive gold in our college clinics forms the best and only means of thoroughly instructing students. Any one who has mastered the art of manipulating cohesive foil cannot fail in the use of soft foil, if in after years it becomes advisable to adopt it to the exclusion of cohesive foil. We therefore dwell upon this point in our lectures and clinics. The transition from cohesive gold to soft and cohesive gold is easy and natural, the former having been properly acquired; but to change from soft to cohesive foil is almost an impossibility, and requires a moral force and manual dexterity not given to all men.

Hence in summing up the thoughts of this paper, I may say that the conclusion arrived at is, that if we are to maintain the present supremacy of being the best gold operators of the world, we must adhere, educationally, to the system of cohesive gold, with its anchorages and perfect welding of parts. If, on the other hand, we desire subsequently to change to a mode less laborious, more capable of giving good pecuniary returns, which will lessen strain on the patient, and, possibly, may be better as a preservative of tooth structure, we must adopt soft foil at the margins, and cohesive to resist the force of attrition in mastication.

ADDRESS OF PRESIDENT W. F. FENDERBERG

READ BEFORE THE PENNSYLVANIA STATE SOCIETY MEETING, PHILADELPHIA,
JUNE 5, 1888.

The progress made in dentistry during the past half century is marvelous. Instead of a simple ratio, it has assumed a geometrical progression, and has compounded with astonishing rapidity. The advance of the world in new ideas, new subjects, new employments and new discoveries cannot be told in a single address.

Half a century ago primitive modes and means of agriculture were the rule. The few trades which clothed, housed and fed men and the professions of medicine, law and divinity comprised largely all the means and employments ministering to the wants of man. But chemistry, mineralogy, metallurgy, geology, botany, philosophical observation, fine machinery, steam and electricity, have so enlarged the domain of knowledge and the employments of mankind that the province of science and knowledge has assumed an extent unknown to our fathers.

The activity and progress that has distinguished modern medicine has pervaded all its collateral branches. The achievements of surgery, the vast and constantly increasing developments in pathology, the revelations of the microscope, the daily additions to knowledge in chemistry and therapeutics are only part of the general advance along the entire line of scientific research; and as every collateral branch keeps pace with the march, dentistry has not lagged behind. The science and art of dentistry has shared in the universal progress.

The most condensed review of the progress of dental science, and the improvements in dental practice during the last half century, is not possible within the limit of time permissible on this occasion. It could only be a catalogue of advances—an illustrated record of how new discoveries in general pathology has illuminated the special pathology of the tooth—an outline picture of the fertility of invention in instruments for aid in securing results from operations that were exceedingly difficult if not entirely impracticable—

a meager history of new operations and new methods of operating, and a bare allusion to the ingenuity and genius which has devised the new methods of remedying the many cases of irregularity of the teeth which we are so often called on to treat.

With this advance and improvement in dental practice, the dignity and standing of the dental practitioner has been elevated. The time existed, and not long ago, when a dentist was looked upon in nearly the same light with the "Copper and Leecher," or if held in higher esteem, as at most only a sort of mechanic, whose business did not require more than a very moderate share of mechanical ingenuity, and who certainly was not supposed to require any knowledge of the vital functions in order to practice his calling in a proper manner.

Gradually dentistry began to take higher rank. Many men of education entered its ranks, and imparted to it tone and character, and before long it was conceded that dentistry was both an art and a science, and its practice no longer a trade, but an honorable profession. Then dental schools were established, at first weak, unrecognized and ridiculed; but in time they grew in strength and number as the importance and needs of special dental education became recognized.

The subject of dental education has been so often discussed before you that were I to occupy your time with a full presentation of its necessities I would, I fear, only weary you with a repetition of remarks with which you are already familiar. The importance of a firm foundation being first laid in the preliminary education of the student is acknowledged by all, and the best means of effecting this, and the standard which shall be required of all who essay to enter the profession, is a question for consideration. The elevation of dental schools in the standard required of students, the thoroughness of the course of study, and the rigidness of final examinations demands the attention of the profession. The profession needs better matriculants and better graduates in dentistry.

Much good has been obtained by special dental education and restrictive dental legislation. The law requiring every dentist to be registered has worked much good to the profession and to the community; but it yet requires increased powers. Where the law has been enforced it has driven away and excluded many unquali-

fied practitioners. There is a difficulty in enforcing the law—by getting a jury to indict a violator. To the Pittsburg Dental Society belongs the credit of having obtained the first conviction under our present law, which occurred within the past month.

But we need a better law, simpler and more restrictive; for the simpler and plainer the law the more easily it can be enforced. A law requiring every one who shall hereafter engage in the practice of dentistry to be a graduate of a reputable dental school, and the registration of his diploma endorsed by a board appointed by the State Society, would be more effective. Such a law would not exclude any one who is at present practicing legitimately.

The wording of a bill to meet the case is a matter demanding consideration. Experience teaches the importance of carefully determining, in advance, what and how much power the legislature can be induced to give. The practical question in the beginning of such attempted legislation is not so much what we would like to have as what can be gotten. It is easy to defeat a measure by asking too much.

Public sentiment must be educated to the need of protective dental legislation. The people and their representatives must be taught that strict State supervision of dental practice is not class legislation—that dental legislation is as much a protection to the people as to the profession.

In the daily interchange of opinions with legislators and constituents, the members of this society and of the profession, could exert a widespread influence in shaping public opinion and in securing a satisfactory dental law.

The influence that dental societies exert in the advancement of dentistry and in the elevation of the profession is underestimated by many.

The increase in the numbers of district societies should be a matter for consideration by the society.

Whatever advances have been made in the State, have either been urged upon the profession and the schools by this body, or have received the endorsement of this society when inaugurated.

The State Society has accomplished much good since its organization. It has been the prime mover in the past—we may hope that it will continue so in the future.

Reports of Society Meetings.

ILLINOIS STATE DENTAL SOCIETY.

TWENTY-FOURTH ANNUAL MEETING.

REPORTED FOR THE INDEPENDENT PRACTITIONER.

BY C. N. JOHNSON, L. D. S., D. D. S.

CONTINUED FROM PAGE 370.

THURSDAY AFTERNOON SESSION.

The next in order was Dr. J. D. Moody's paper on "Some main points touching the conservative treatment of teeth whose pulps are nearly or quite exposed."

In this paper the essayist confined himself to those pulps which were nearly exposed and gave his method of treating them. The majority of teeth with which we have to do are of faulty organization. The characteristic white, chalky, friable enamel, disintegrated dentine, and a leathery mass occupying the bulk of the cavity, tell the story with which we are all so familiar. As a text, we will suppose a cavity on the distal surface of a cuspid, bicuspid or molar, in a tooth like the above. An impacted metal filling in such a case is incompatible with tooth structure, and is the worst material under these circumstances to employ at first. In some cases we might use an oxyphosphate, with tin and gold over it, but in many instances recurrence of decay will take place. The factors are: lowered vitality, frail tooth structure, micro-organisms, and a sensitive pulp.

He outlined his treatment of these cases as follows: "Where inflammation exists, first subdue it by any of the known remedies used for this purpose. Then use some kind of filling which is non-irritant, moisture tight, a non-conductor, compatible with tooth structure, and with some degree of permanency. These qualities are found only in the cements and gutta-percha. First apply the rubber-dam, to insure dryness. Then, in excavating leave a portion of dentine over the pulp-chamber, but be sure that you have clean margins. The essential point in these operations is to pack a line of gutta-percha along the cervical margin of the

cavity, trimming it down even with the edges. Then complete the filling with oxyphosphate, and coat it all with chloxypercha or sandarac varnish till it crystallizes. By the use of gutta-percha you prevent disintegration of the oxyphosphate at the cervical margin. Leave this in from six months to two years; then you can usually refill with metal. The reasons for this treatment are, that in time teeth become harder, and will resist decay and bear contact with metal fillings better; and this hardening and the formation of secondary dentine renders the tooth more capable of bearing impact than before. Oxyphosphate is non-irritant to a pulp in near exposures, or so only in rare cases."

Mastic varnish has been advocated as a protection to the pulp before putting in oxyphosphate, but in the use of this material the pulp does not need protection, and the use of the varnish precludes the very thing for which the cement is used, viz., its therapeutical action upon both the pulp and tooth substance. Oxyphosphate is the best material for this purpose. It is tolerated by tooth structure, and by the pulp if not quite exposed, better than anything with which he was acquainted.

In treating on this subject the essayist was led to compare notes with Dr. W. D. Miller, who, in an article in the *INDEPENDENT PRACTITIONER* for February, 1885, condemns oxyphosphate as being unreliable for a temporary filling, stating that, as a rule, in a short time it will be dissolved out at the cervical margin, and that secondary caries advances with rapidity, because the antiseptic properties of oxyphosphate are almost zero. He also affirms that the smallest amount of moisture in the dentine prevents thorough adaptation of the cement. On page 52 he says:

"We need in a cement a material which may be used on very soft, porous teeth, sometimes over partially decalcified, resist dentine, and which will not only stop decomposition of softened dentine under the filling, but will also effectually shut out external agents, and at the same time, if possible, incite the underlying dentine to a recalcification. In all these points the oxyphosphates are wanting, besides giving very inconstant results in the most favorable cases."

Now, the essayist found that in almost every case of those cases cited his experience has been exactly the opposite, and believed that Dr. Miller's failures have been due to the fact that he did not use gutta-percha at the cervical margin.

He quoted 524 cases which have come under his observation in the last year, and all these of the extreme character spoken of in the beginning of the paper. Of these 243 were left one year and then filled permanently. In 230 of these the pulp was in good condition; five contained dead pulps where he did not expect them, and eight where they were marked doubtful. Those left about two years and then filled permanently numbered 190. Of these 179 were in good condition, six contained dead pulps where not expected, and five where marked doubtful. The remaining 91 cases, left over two years, the average time being three and a half years each, have in the majority been replaced with metal fillings, the remainder being in good condition yet.

He does not claim great permanency for oxyphosphate fillings, but by the use of this material these frail teeth become harder, the pulp is better protected, and the tooth placed in a suitable condition for the insertion of a permanent filling. Altogether, it is given more years of serviceability than by any other means.

Session adjourned.

THURSDAY EVENING.

Dr. W. A. Johnston read a paper on "What Shall We Do with Inflamed Pulps?" The following is an abstract:

The question, "What shall we do with inflamed pulps?" is much like the one, "What shall we do with our daughters?"—it continually confronts us. The man who has no failures in treating inflamed pulps probably has no practice. Inflammation in a pulp is the same as inflammation in other tissues in its symptoms and sequelæ, and may terminate either by resolution or putrefaction; but it is unlike other inflammations on account of its position, having unyielding surroundings. It also lacks absorbents to carry away inflammatory products, and the blood supply may be cut off. The brain is contained in a long box, and inflammation of the brain is very dangerous, but even this has openings through which the membranes and cerebro-spinal fluid may protrude, and thus relieve the pressure. The tooth has no such safety-valve; an inflamed pulp means toothache.

In most cases destruction of the pulp is necessary, but if there is only slight trouble from pulp stones we may reduce it by counter irritation on the gums. If the pulp is acutely inflamed, open into the pulp chamber to give relief.

First remove the cause; then, when the pain subsides, give a saline cathartic for systemic treatment. In using iodine for counter irritation, do not use a steel instrument to apply it; wind a little cotton on a match-stick—and you will use iodine, not iodide of iron. If remedies fail to relieve the trouble, then devitalize. First quiet the pain with some one of the stimulating, warm tanning, volatile drugs, before applying arsenic. If this medicine will also remove the exudate, it is better. A continuous current of warm air on a nearly exposed pulp will relieve sensibility, and if our remedies are warmed, we will save suffering.

If we can persuade the blood to leave the crowded territory, all will be well, but otherwise the white blood corpuscles will work out of the vessels and die, and suppuration begins. For diverting the blood, stimulants are indicated.

If destruction of the pulp is necessary, we should not previously apply escharotics, on account of forming an eschar through which the arsenic cannot act with certainty.

It is good to administer quinine in the cases just described; it has a tonic effect on the nervous system. Especially is this necessary in malarial districts, and then a full dose should be given. I would not introduce a permanent filling over a pulp which had been recently inflamed; if trouble occurs, it is more difficult of removal.

The best method of destroying pulps is to relieve the pain, remove the bloodclots and coagula, and apply arsenic one part, hydrochlorate of cocaine four parts, and lanolin five parts, allowing the application to remain 24 hours.

Inflammation of the pulp seldom yields to cocaine, but when it is combined with lanolin the effect is sometimes magical. The essayist applied this once to an aching molar in a boy of fifteen, sealing it with gutta-percha. The pain subsided, and the following day he removed the pulp painlessly. In these cases the pulp comes out as though greased.

Pain on occlusion in an inflamed tooth can be relieved by holding a wooden toothpick between the tooth of the opposite side.

Capping a pulp which has once been inflamed is doubtful practice. Patients lose confidence in us if we fail, even though we may have done our best. With our facilities in the way of instruments for removing pulps, it is better to destroy. In any of these operations we must be careful and thorough.

Patients come to us for three reasons—prudence, pride, or pain. The latter is most often the incentive, and we must study to relieve it. The cases where pulp capping would be the most successful are those in which the patients are young, black-haired, and healthy.

The papers of Dr. Moody and Dr. Johnston were discussed together.

DISCUSSION.

Dr. A. W. Harlan—In opening this discussion, I would say in the first place that the essayist has treated the subject in a manner fitting its importance. In answer to the question, “What shall we do with inflamed pulps?” I cannot agree that all should be destroyed. Pulps in young persons’ teeth should be saved if possible. It would be bad practice to destroy pulps in the first permanent molars at seven or eight years; also in the central incisors. They should not be destroyed before the teeth have attained their growth. Pulps of teeth that are inflamed should not always be destroyed in adult life. In the anterior part of the mouth it sometimes causes disfigurement on account of discoloration, especially in women.

I have little hope of the permanency of capping in adults, where the pulp has been inflamed for any length of time, and where, when the pulp is probed, pus follows, though in vigorous patients the pulp may live.

The necessity for retaining pulps is not so great after the twenty-fifth year, when the teeth have attained their development. The teaching of the paper is good, and the combination of arsenic, cocaine and lanolin is efficacious in destroying pulps. The essayist did not mention the value of a blister as a counter irritant; it should not be lost sight of. I concur in the statement that remedies should be warmed before applying to a pulp. In cases where it is undesirable to destroy an inflamed pulp, use agents to reduce the local inflammation and reduce the blood pressure, such as counter irritants. In general, systemic treatment is of little use, owing to the bony canals surrounding the pulp. It is a good practice to puncture the pulp carefully to bring relief. Apply iodoform or iodol, and seal the cavity without pressure. After the pulp has been punctured and sealed for a week, I do not favor further application of remedies that will destroy the surface of the pulp. The least irritation the better. I would not advocate any immediate capping, but would dress tempo-

rarily and allow to remain a few weeks. Many failures result from too much haste, and from the manner of introducing the material. It should be inserted so as not to cause pressure.

Inflamed pulps in young persons may be saved by the plan of treatment given by the essayist, or that which I have proposed.

Dr. Crouse—I was in hopes Dr. Harlan would review the other paper. I am somewhat disappointed with the views of Dr. Moody, and also with his treatment. I shall be obliged to take the opposite side. I have no faith in this theory of incompatibility; I never could understand it. I do know that dentine under tin and gold will sometimes grow hard. One provision of nature is to mature destruction of parts, and under favorable circumstances it will do it. I have in my own mouth two cavities in which no filling had been inserted. The decay progressed to a certain point and then stopped, and it is now hard, and the dentine will shine when cut. I do not object to the use of temporary fillings, but I take issue with Dr. Moody in his selection of materials. If tin is ever preferable to use in the mouth, it is in these cases. It is better than any of the oxyphosphates or oxychlorides. Amalgam is better than either. Oxyphosphates and oxychlorides are too temporary. The essayist recommended lining the cervical margin with gutta-percha. That is good, but it is better to use it in the whole cavity.

The best application for an exposed or nearly exposed pulp is tannic acid, saturated solution. It forms a coagulum. Then apply oxychloride of zinc, and you have the best capping possible. This must be done carefully; it is the most delicate operation in dentistry. I have employed this method for eighteen years; I have frequently tried others, but always go back to the old plan. I would strongly advocate a careful trial of my method. Do not try it simply to prove its fallacy, but go about it conscientiously, to honestly find out if there is anything in it. I have had less failures with it than with any other. Some of the pulps may die, but ordinarily you never hear from them, as the teeth do not discolor and there is no disturbance. Sometimes the patient will tell you there has been a twinge of pain, but that is all. The pulps which die under this treatment become mummified, and cause no trouble. You should always explain to patients the chances taken in capping.

As to treatment in the way of filling, as I have said, I should use gutta-percha for the entire filling, rather than any oxyphosphate

or oxychloride. I was pleased with the manner in which Dr. Moody stated and kept a record of his cases; I have kept one eighteen years. In capping, the mistake is sometimes made of using too small a cap. Let it extend well around the exposure.

Dr. Wassall—Years ago all dentists capped pulps with oxychloride, with more or less success. Later on, oxyphosphate was introduced, and operators had greater success. Dr. Crouse has been peculiarly successful with oxychloride, but I think he could be more successful with oxyphosphate. There is one phase of pulp disease which is very difficult of diagnosis. It is the first stage of inflammation, known as hyperæmia, or simple congestion. The pain is usually obscure and difficult to locate. It may cause neuralgic pains on one side of the head, and if so, the offending member will be found on the same side. A case recently came under my notice where the patient complained of pain on one side, and in searching for the seat of trouble I found several large fillings, all in good condition, with living pulps. Apparently there was nothing to point out which tooth caused the disturbance; but on tapping them I found a slight soreness in one, and this gave an index to the trouble. The heat test is not always reliable in proving the condition of the pulps, as you will often get a response when the pulp is dead, on account of the gas expanding in the pulp-chamber, and causing pressure at the apex. Then again, a live pulp will not always respond to heat, so that percussion is the best test.

Dr. Gilmer—I have used something for counter-irritation where pulps are inflamed, that takes the place of capsicum plasters. I procure a common mustard plaster, cut it up into pieces of a suitable size and use them.

In capping pulps in anterior teeth, room is a consideration. You cannot use a large capping. I would place a small piece of quill in position and flow oxyphosphate over it. The quill will not be destroyed.

Dr. Wassall spoke about the unreliability of heat in testing a pulp. If he had used cold, he would have succeeded better.

Dr. Cushing—What has been said has mostly covered the ground. The papers were good. I must emphasize Dr. Crouse's advocacy of oxychloride in capping pulps. We capped many pulps in the beginning that should not have been attempted, and at first they

seemed to do well, but there came a time when they did not seem so successful. Then we believed that oxychloride was too much of an irritant, and accepted oxyphosphate as the proper material. We used it till we became convinced that it was not so good as oxychloride. More pulps die from the effects of oxyphosphate than from oxychloride, so that I have abandoned it and use the latter.

Dr. Crouse stated that capping a pulp is a most delicate operation. It is so. Many failures result from causing pressure on the pulp, but with oxychloride it is possible to cap a pulp to any thickness without pressure, by flowing the material over it in a very liquid form. It requires longer to set, but in those cases it is better to take time. Ordinarily, young men are too hasty in filling teeth permanently.

It may seem strange to the younger members to hear so great a diversity of opinion, but we differ in manipulation and judgment, and you must not be confounded when you hear different reports.

It is sometimes absolutely necessary to enucleate or save a pulp. I apply copal ether varnish previous to flowing the oxychloride over the pulp, and in nine cases out of ten there is no pain.

Dr. Morrison—I want to add my testimony to Drs. Crouse and Cushing. In 1861 I had an exposed pulp, and the best dentists advocated the removal of the tooth on account of the crowded condition of the teeth and the large exposure of the pulp. They said it could not be saved alive. That pulp was capped with oxychloride, which caused most intense pain for a moment. It was then filled with gold, which remained in fifteen years, and I am now wearing a platinum shell over the tooth. It is the most sensitive tooth in my mouth to-day.

My method in capping is to use wood creosote in the cavity for a minute; then absorb the excess, and apply the oxychloride thin. I use a French bibulous paper to follow up the material, and it absorbs the moisture and dries the oxychloride.

Sometimes an inflamed pulp, under a filling, will cause deep-seated aches on the side of the jaw, especially at this season of the year, and in malarial districts. The patients cannot point out the tooth, and it is hard for the dentist to do it till about ten days after the trouble begins. Then ordinarily some one tooth will respond to tapping. Usually these troubles will pass off if the patient has patience.

Dr. Harlan—There is scarcely any more important subject in dentistry. We should take proper preliminary precaution in treating these cases. Use the rubber-dam; and another point is to cleanse the mouth with properly tempered water. Again, after it has been determined advisable to cap, you should study to have the filling covering the cap made of such a shape that you can enter the pulp-canal without disturbing the filling in case trouble follows.

The best thing *Dr. Cushing* said was when he recommended copal ether varnish. It is non-irritant, unyielding, and prevents the probability of pain from the oxychloride. If the pulp is healthy, it is not so important what we use. In these operations we must be extremely careful; but if we are honest and conscientious, we may save many pulps that are destroyed.

Dr. Sitherwood—Instead of using the mustard plaster recommended by *Dr. Gilmer*, I buy the regular capsicum plaster, and cut it up into suitable sizes. It is thinner than the pads we get for this purpose.

Dr. Keith—I would like to ask what is the advantage of using oxychloride over oxyphosphate when the pulp is capped with copal varnish?

Dr. Noyes—It always seemed to me difficult to understand why an inflamed or exposed pulp should be treated differently from any other wound. The essentials of success in the treatment of exposed pulps are: First, cure the trouble; second, render the cavity and contents aseptic; third, protect the pulp perfectly without irritation, and shield it from heat or cold. If we want success in these cases, we must recognize the fact that septic poisoning is always possible in the mouth. These essentials can be secured by a variety of methods, where the operator is skillful and the opportunity favorable. The treatment may be thus summed up: Removal of irritants, protection of the pulp from further irritation and counter-irritation.

You can gain antisepsis better by non-escharotic than by escharotic means. There is no reason for irritating or producing an eschar on the surface of the pulp after the disease had been cured. It may be necessary, to induce a cure, but usually it will yield to milder methods.

Dr. A. W. Freeman—I have never seen a tooth with the pulp alive that would not respond to hot gutta-percha.

Dr. Townsend—I have seen many cases where I could not get a response from gutta-percha, but have always been successful with rhigolene spray. I have capped pulps with oxyphosphate and they are living.

Dr. Taggart—Some gentlemen condemn the use of carbolic acid in certain places because it will coagulate albumen, while they advocate bichloride of mercury for the same cases. Now, the latter will also coagulate albumen, if chemistry is right.

Dr. Cummins—My method of treating exposed pulps is as follows: After excavating thoroughly I apply creosote for half a minute. I then use a formula of cocaine, chloroform, morphia, and oil of cajeput. After this is applied I use spunk with one side coated with copal ether varnish, and let it remain six or eight hours. I then cap with the varnish over the spunk, and if at that time the pulp is all right, I fill with gold or amalgam. If not, I puncture the pulp and use olive oil and glycerine, one to six.

Dr. Stevens—I am glad so many are succeeding; I have never saved an exposed pulp by these methods.

Subject passed.

(TO BE CONTINUED.)

PENNSYLVANIA STATE DENTAL SOCIETY.

TWENTIETH ANNUAL MEETING HELD IN PHILADELPHIA, JUNE 5, 6, 7, 8, 1888.

ESPECIALLY REPORTED FOR THE INDEPENDENT PRACTITIONER.

WEDNESDAY AFTERNOON SESSION.

DISCUSSION ON DR. SUDBUTH'S PAPER, ENTITLED "THE TRENDS OF DENTAL THERAPEUTICS."

Dr. G. S. Allan, of New York—There is no question, whatever, but that the dental profession is fully abreast of the times in all that pertains to therapeutics and materia medica. We make use of everything offered in the way of antiseptics or germicides, and we have among our members men of the greatest ability, whose researches have enriched, not only our own literature, but that of medicine also. The science of bacteriology seems to be all-pervading. One can hardly take up a paper or talk with a stranger without being amazed at the wide-spread influence of "bugs," as

some roughly call them—bugs in the air, bugs in the water we drink, bugs everywhere.

We are indebted to Dr. Miller for what we know in regard to the etiology of caries, and also for the basis upon which to establish a line of preventive treatment, and yet he has not told us all, for he, himself, says that our knowledge is only in its infancy. Nevertheless, upwards of sixty separate forms of micro-organisms found in the mouth have been isolated and studied. It is true that many of these are harmless in character, a few give off lactic acid as a waste product, and thus produce decay, as a result of their growth. No other theory has ever been promulgated that will account for the formation of cavities other than the one given us by Dr. Miller.

Dr. Sudduth has truly said that the trend of our practice should be in the direction of prevention. I make use of antiseptics in my practice constantly, which I find especially applicable in extraction. Dr. Miller has called attention to its application here. You all, no doubt, have had unpleasant experiences—inflammatory results—tedious cures. Much trouble may be avoided by the use of antiseptic mouth washes and gargles, which must be used before and after extraction.

In opening into pulps my first act is to sterilize the cavity with a $\frac{1}{5}$ of 1 per cent. sol. bichloride of mercury, and then take every care not to force any of the contents of the pulp chamber through the apical foramen. I invariably dip my barbed points in the bichloride solution, as also all instruments used in removing dead pulps. I use the same precaution in the treatment of exposed pulps. I believe that fully one-half of the cases of failure after exposure is due to infection at the time of exposure, if the case be one of instrumentation. The moment I expose a pulp I touch it with bichloride solution, and afterwards seal it up with ether and rosin as a protective coating.

In the treatment of pyorrhœa alveolaris, antiseptic treatment comes in very happily. My first object is to remove the accumulations of tartar as well as possible with "cold steel," and then pass up around the root a sharp pointed stick saturated with a solution of 1 part pure sulphuric acid to 35 parts water. This is sufficiently strong to dissolve the tartar, but does not injure the gums or soft tissues.

Dr. Magill, Erie, Pa.—Dr. Allan's remarks were of great interest to me. I have been using hydronaphthol for some time with great satisfaction. I also use acids in the treatment of pyorrhea alveolaris and think that good results may be obtained from the use of bichloride of mercury.

Dr. Faught, Philadelphia—I have used the antiseptic tablets introduced by Dr. Carl Seiler, and find that they make a very agreeable mouth wash, and one that can be recommended.

Dr. Kirk, Philadelphia—I desire to call attention to the use of chloride of zinc in the treatment of pyorrhea alveolaris. My attention was first directed to it by Dr. Essig. I have had a very satisfactory experience with it in a number of bad cases, using it in the strength of from $2\frac{1}{2}$ to 3 grains to the ounce. One patient, a lady, had it in daily use for nearly a year. When she first came to me I thought that she would have to lose the lower incisors. After removing the tartar I dismissed her, with the prescription as above given. At the end of the time the gums had reattached themselves to the teeth. There had been no "creeping up" of the membrane; the teeth were simply tightened and answered all the requirements of mastication. The improvement in the condition of the mucous membrane was remarkable.

Dr. James Truena, Philadelphia—This is a subject that perhaps interests me more than any other. I do not think that the dental profession has paid the attention to it in the past that it deserves, and it must have larger observation in the future. We are liable, however, to make mistakes in our conclusions. I noticed one remark made by Dr. Sudduth, with which I cannot agree, viz.: "That the mouth is not the place for micro-organisms." I believe that micro-organisms have an important function to play in digestion and other matters connected with the oral cavity. It seems to me that we are running to extremes in the matter. It has been well said that their waste products will eventually destroy them, and some kinds may destroy others. In regard to antiseptics it is possible to go to too great extremes. It is important that the mouth be kept in a healthy condition, and an antiseptic used once in the twenty-four hours. The great fault I find with dentists generally is that they are "routinists;" they begin with some one agent, it may be creosote or iodoform, or some other, and they continue with it year in and year out. There have been a great many anti-

septics introduced within the last three years—some inhibitory—others germicidal in character.

I do not believe in confining oneself to an agent so poisonous as bichloride of mercury. I know of no better agent to use than hydronaphthol. It is perfectly harmless. I prescribe it as a mouth wash and for cleansing rubber plates. Dr. Black first pointed out that the inflammation in mouths where rubber plates were worn was due to micro-organisms, and I can fully substantiate his observations. In cases where I have used hydronaphthol the mouth was free from inflammation. I believe in simple formulas, and do not use complex prescriptions. I believe that tooth powders, no matter whether antiseptic or not, are injurious. An irritation can not be kept up continuously without finally resulting in gingivitis. I know that in holding these views I oppose many, perhaps all. I do not interdict their use because they injure the enamel, but because of the irritation to the gums that may subsequently result in pyorrhœa. I use sulphuric acid—not the aromatic, but the commercial form, in the treatment of pyorrhœa. I do not allow it to remain long upon the gums, but follow it up with bicarbonate of soda, which, by its effervescence, throws out the debris better than peroxide of hydrogen. Pyorrhœa alveolaris is caused by micro-organisms, and must be treated in an entirely different manner from serumal deposits.

Dr. Allan—I confess I dissent very positively from what Dr. Truman has said. I do not see how a tooth can be kept clean without tooth powders, and after many years of personal use I fail to find any deleterious results from their use. I desire to state positively my belief that pyorrhœa alveolaris is always preceded by a deposit of serumal tartar, without which it does not occur. The first thing to do in treatment of any disease is to remove the cause. I do not believe that the most careful manipulation with steel instruments will accomplish this in all cases. Therefore I use sulphuric acid as my sheet anchor.

Dr. Sudduth—The deposits of the salts of calcium in pyorrhœa alveolaris are, in my opinion, the sequence and not the cause of the disease. I have failed to find the first case of serumic deposits where there was not evidence of previous catarrhal inflammation. Wherever chronic inflammation occurs, there lime salts are apt to be deposited. This often occurs in the eye and the brain. I

have never found serous deposits beneath a perfectly healthy gum.

Dr. Peirce—I believe with Dr. Sudduth, that pyorrhea alveolaris is a systemic condition, and that the tendency thereto is often inherited. I believe that the lime salts are a symptom and not the cause of pyorrhea, and the micro-organisms are an accompaniment of inflammatory conditions, because they find in such conditions a suitable pabulum for their growth. They do not take hold of healthy tissues, but are found in diseased tissues, and exaggerate the already depraved condition by their presence. If we can keep the parts antisepticalised we may modify the disease, but as long as the general systemic condition exists there is apt to be a recurrence. I do not know of any better method of treatment than that mentioned by Dr. Allan. I also use chloride of zinc, and am very much in favor of it because of its astringent and antiseptic action. I sometimes use it in the treatment of chancres in the strength of from 3 to 4 grains to the ounce.

Dr. Guilford, Philadelphia—In regard to the treatment of exposed pulps a great many methods have been advocated. Some years since Dr. King, of Pittsburg, used oxide of zinc, made into a paste with carbolic acid. Many use it to-day and speak very favorably of it. When a pulp is exposed we have to be careful to leave no space for it to strangle itself in, also to make no pressure upon the pulp, because in so doing we only aggravate the inflammation and cause the death of the pulp. Always try to prevent subsequent irritation. The best method of treating exposed pulps was introduced by Dr. C. E. Francis, of New York, who uses paper disks saturated with canada balsam, dissolved in chloroform. The balsam causes the capping to adhere to the walls of the cavity. I have modified this by using several thicknesses of cellulose paper, which can be more easily adapted to the cavity; another very good application consists of a paste made of sulphate of morphia crystals, mixed with a sufficient quantity of carbolic acid to form a paste. The carbolic acid no doubt acts as a germicide, although I had not thought of it in that light. At any rate I have been exceedingly well satisfied with the results of treatment. While I have had some failures, yet the general results have been good.

Dr. Peirce—I use carbolic acid diluted with a small quantity of chloride of zinc, which coagulates a layer of albumen upon the

surface and forms a good non-conducting capping that is not readily soluble and which does not make a good culture media for micro-organism; besides, the solution serves as a germicide.

Dr. Faught—I have had some experience in the treatment of pulps after amputating a portion. I use a small piece of bibulous paper saturated with oil of eucalyptus, which acts as a sedative, and is non-irritating. One case where I amputated a portion of the pulp in a superior molar has been under observation for more than a year, and I have every reason to believe it is in good condition.

Dr. Ward, Philadelphia—I have used disks made from printing paper as a capping for exposed pulp, with good results.

Dr. C. B. Kratzer—Following the practice of Dr. Smith, of Pittsburg, I, with several others, have used paper disks, saturated with pure wood creosote, not carbolic acid, for several years with marked success.

Subject passed.

MORNING SESSION, JUNE 6, 1888.

Discussion on Dr. Truman's paper (printed elsewhere in present number).

Dr. Peirce—The subject under consideration is one of great interest. I object to the proposition that cohesive foil is the best foil for students to begin with, because they have to use the mallet, and consequently do not learn that delicate touch that is required in adapting the gold to the walls of the cavity, which is acquired by hand pressure and soft foil. The method I pursue and teach my students is to first line the cavity with soft foil and work it into position by hand pressure. Then to finish with cohesive pellets. I think by this method better results may be obtained than by any other. Another objection to cohesive foil, in the hands of students, is found in the liability of the gold to ball because of its hardness. If fillings are taken out it will be discovered that this has occurred around the edges where little inequalities reveal that the gold has bridged in places.

Dr. Guilford—Dr. Truman uses the term soft foil in a way that I would not. Dr. Peirce also used the term cohesive differently from what I do. Confusion is liable to occur from the loose use of terms. In the first place, by cohesive foil we mean a pure gold foil, the particles of which will unite even at the slightest touch; on the other hand, non-cohesive foil should be included under that

class of foils where the different particles do not adhere. As marked examples of such foils two may be mentioned as being on the market. Williams, of New York, cohesive, and Atkey, of Philadelphia, non-cohesive or soft. When this latter foil is folded it does not cohere, even if pressure is brought to bear upon it. It is absolutely non-cohesive. Intermediate between these two is another kind, that mentioned by Dr. Truman this morning, and which was in use when I entered the profession some twenty-five years since—a gold with very soft working qualities, but which when pressure is used is slightly cohesive, sufficiently so to hold it in place. It will not ball up or curl under the instrument. It spreads nicely under pressure, giving great adaptability. Soft foil cannot be used except in simple cavities having good walls. Strictly cohesive foil is objectionable because of its non-adaptability. We get the good qualities of each in semi-cohesive foil. It has the adaptability of non-cohesive foil and sufficient cohesive qualities to keep its position. When greater adhesion is required it may be obtained by heating it. If strictly non-cohesive foil is used to line cavities it is apt to be displaced—whereas semi-cohesive foil will remain where you put it.

Dr. Peirce advocates using non-cohesive foil around the margins of the cavities; this involves difficulties that may be overcome by the use of semi-cohesive foil, with which the same results may be obtained. Others have resorted to the use of tin for the cervical margins of cavities, filling over it with gold. I do not find this necessary. I can get just as good results with semi-cohesive foil. In regard to teaching students, I think their instruction should be as broad as possible, yet one particular method which is considered best should be dwelt upon, because the time of attendance upon instruction and also the capacity of students to grasp ideas is limited. I believe that one particular method should be emphasized, not, however, ignoring others. The fullest clinical instruction should be afforded by different operators.

Dr. Mayall—The essayist alluded to influences that point toward a reaction in the profession to-day. I have observed the same myself. In looking over the past experience of the profession we see a most wonderful development. The cohesive qualities of foil gave a great impetus to contour work. The enthusiasm of operators and the prosperous times following the war combined to accomplish results

that would not be submitted to at the present day. The reaction has come, both upon the part of the profession and the public, calling for lesser operations. It is a conservative movement toward a more sensible basis. I think the position Dr. Guilford takes is wrong. Dr. Truman is right. Dr. Truman says it is non-cohesive or cohesive foil, and the methods which are successful with non-cohesive foil are different from those which meet with success in the use of cohesive foil. I recognize them as two different systems. I do not mix them. It is cohesive or non-cohesive. If I build upon a non-cohesive filling it is a compromise, but if I take the course that Dr. Guilford pursues, it is nothing but a cohesive filling. Now in the use of cohesive foil we recognize from the start that there is nothing like that. It must be perfect from first to last. In building up the cohesive filling we build upon cohesive principles. I admit there are advantages in the use of semi-cohesive foil, but when you take issue with Dr. Peirce, where he uses a non-cohesive partly and a cohesive partly, I do not see where we are bettered by having his method than by using semi-cohesive. I have come to the conclusion that as a tooth saver non-cohesive is better than cohesive. I put it this way: The dentist does better work with non-cohesive foil than cohesive, but cohesive is the acme if you can get a man with the hand to make it perfect work.

Dr. J. S. Smith—Theories are all right if we could only put them into practice. That is what is wanted. We want men who will take the subject and make it practical. I find that the soft foil spoken of is a good thing for lining cavities. I believe that the cohesive foil used in lining the margins and at certain points at the cervical wall will produce failures, no matter how careful the manipulator may be. It depends largely upon manipulative skill in all cases of filling. My method has always been to use soft gold in retaining pits and to line walls; and as for finishing, I can do that with cohesive or semi-cohesive. It does not matter whether we have the two grades of foil or not. I would sooner have two grades right than one grade wrong. I have been using what is called a soft cohesive foil. I find it is a good foil to use, and it has been doing well in my hands. I do not believe in this thing of changing manufacturers of gold foil. I do not wish to be misunderstood in this respect, but I have adhered to one make for at

least fourteen years. In the matter of filling teeth with cohesive foil we must commence right, and must carry the operations entirely through. As far as that is concerned, there is an incentive in teaching students to manipulate. They should learn how to use the mallet, and I always believe in the electric mallet. I think a young man should take a year's training with the hand mallet to obtain the sense of touch. I believe he will become a better manipulator.

Dr. Gerhart—The remarks that were made by Dr. Magill were eminently just. It must not be forgotten that the final object of filling is not ornamentation but conservation—that is, the arrestation of decay, and when we look to the value of different varieties of gold, it is necessary to take a broader view than simply isolated cases. When you find a community where operators have confined themselves to one kind of gold and another community where other kinds of gold have been used, one of the safest ways to determine the different value of these two kinds of gold is to note the differences in the proportion of artificial teeth worn in these communities. I know a community where two operators controlled a great deal of work for a number of years, and where soft foil has been used almost exclusively. I can say conclusively that in that community there are fewer people between fifteen and forty years of age wearing artificial dentures than in any other community I have ever seen. I think this is a point of value.

Dr. Kingsbury—I commenced the practice of my profession at eighteen years of age, and have filled teeth almost continuously from that time to the present, and having been an industrious worker, I presume have had as much experience in filling teeth with non-cohesive gold as any one in the room, and yet I would not undertake to say that my opinion should overrate that of others by any means.

If there is any virtue in using one kind for a long period of time I have enjoyed that privilege, for I have used Abbey's foil for a long time. When I first commenced the use of that foil it was the one gold foil manufactured in the world. There were very few manufacturers of gold foil in 1838—very few—and this foil went all over the world—China, mostly Japan—for there were a few dentists there, and to Europe—to France, although in Germany and France they filled teeth largely with lead; and in other kingdoms

of Europe they used amalgam principally, for it had come into use before that time. Great changes have come since that first gold filling. Different varieties of gold have have come up. There are many cases where cohesive foil is indicated and should be used, but there are a larger number of cases by far where non-cohesive or soft gold is indicated and will do better service. I think it is an established fact that the better the filling is adapted to the walls of the cavity, and the more effectually the cavity is sealed against moisture and air, the more perfectly we preserve the tooth, other conditions being equal, and on account of the superior mobility of soft or non-cohesive gold over the cohesive. I think it is a much easier task to make a more perfect filling with non-cohesive foil in a large proportion of cases than with cohesive foil. I think a very great mistake is made on the part of the profession in relying upon certain points or cavities made at different distances, commencing with cohesive gold and filling the cavities in that way. I think the better plan is always to make the usual form of the cavity favorable for the retention of the filling, and not be dependent upon these little anchorage points. Make the general form of the cavity of the tooth such as will be maintained by the wedging process of the filling you insert. Such teeth will be better preserved. Probably I have not had as much experience in the use of cohesive foil and building up the crowns of teeth as some of those present.

I have built up a number of crowns with gold. We have a great many patients that will not endure these operations, nor are they willing to remunerate us for the length of time and skill required. I am greatly in favor of gold foil in all those cases where the general form of the cavity will maintain the filling without the aid of pits, so much used by many operators. Many teeth have been filled with cohesive foil and the fillings come out, leaving a little gold in the anchorage. This is a strong argument for the use of soft foil, depending, as it does, upon the shape of the cavity for its retention more than upon retaining points. In forming these cavities operators often injure the pulp and cause devitalization. I feel that more teeth are preserved by being filled with non-cohesive than by the use of cohesive gold foil. I do not stand here as a champion for gold over all other fillings. I think teeth may be saved by plastic fillings, and other metallic fillings as well as gold, but gold is the ne plus ultra of all material we use, and I am very partial to its use.

(TO BE CONTINUED.)

Editorial.

DENTISTRY A SPECIALTY IN MEDICINE.

No one at the present day questions the position of dentistry as a branch of the healing art, and as such a specialty in medicine. The open question, however, remains as to the manner in which recognition shall be extended to us by the medical profession, whether as a body or as individuals. The individual members of the profession who have done most to secure recognition for the body corporate have been liberally or medically educated men. It cannot be denied but that it was through the efforts and personal standing of these men that the profession was seated as a body in the American Medical Association and the Ninth International Congress. Yet no restriction was placed upon any one. The door was opened to all to unite with the medical profession, and form a section in their annual meetings, whether they possessed an M. D. or not. By its action the American Medical Association plainly said that it was willing and glad to recognize us as specialists in medicine, and by so doing it came fully half way to meet us; overlooking our deficiencies, it accorded us a hearty welcome. To turn our backs upon them now would indeed be unappreciative, to say the least. Those who have been most strenuous in their demands for separate professional standing have been entirely dissuaded by the open recognition accorded. Their principal argument has been that the medical profession would not recognize us, hence we should stand upon our dignity and form a separate profession. That ground has been entirely removed, and full and fair recognition has been accorded. In view of our many well-known shortcomings we should accept the recognition extended, and try to merit the confidence reposed in us by immediately advancing the standard of dental education, and in every way possible elevating the position of our degree.

There is a vast difference between practicing medicine and practicing a specialty in medicine. The first involves a practical knowledge of the art of medicine, while the latter requires only a general knowledge of the science and a special knowledge of the art of the branch elected to pursue. It is not necessary that an individual, in order to be recognized as a medical specialist before

the law, should possess a medical degree. All that the law requires is that he obtain a certificate of proficiency in medicine from the State Board of Examiners in the State where he desires to practice. Many of the graduates of our dental colleges are sufficiently well prepared to pass the required examination. All that would be necessary would be for them to spend a short time on those few branches that are not specially required in the dental curriculum, notably the science of practice and obstetrics. Anatomy, chemistry, surgery and physiology are the same for both schools. Why any one should claim that because a student elects to substitute the art of dentistry for the art of medicine and obstetrics he should be debarred from recognition as a specialist in medicine is beyond comprehension. Just so soon as the branches common to medicine and dentistry shall be taught equally well in dental as in medical colleges, then will the distinction be done away with. But even then, unless we perfect ourselves in the art as well as the science of medicine, we should not have the right to receive the title of M. D. That title should be reserved for fully qualified graduates in medicine, and should not be conferred upon dental graduates. Because the law gives us the right to practice a branch of the healing art, that is no reason why we should assume to practice the whole. The American Medical Association did not elect to issue certificates of proficiency in obstetrics to those members of the dental profession who availed themselves of the privilege offered to form a dental section in their body, but it did say it recognized us as their protégé because all that we have that has elevated us above a trade has been derived from medical science. Step by step, one after another of the medical branches have been incorporated into the dental curriculum, until now it is considered essential to employ largely medically educated men to instruct in those branches. We have been most magnanimously recognized as specialists in medicine by the medical profession; such recognition does not, however, establish us as such in the eyes of the law. Before such a standing shall be attained we must incorporate the science of medicine and obstetrics in our curriculum, and require proficiency in these branches before granting the degree of D. D. S. When this is done, and not before, will immunity from legal prosecution for ill results of practice that does not strictly belong to our specialty be secured. This question is one of very considerable interest to us

as a profession. Those who are practicing implantation, having none other than the title of D. D. S., or not having qualified before the law, are laying themselves liable to legal prosecution for every case in which they operate, and their position would not be a very agreeable one in case of bad results.

THE NECESSITY FOR A HIGHER STANDARD.

The question naturally arises as to how we shall meet the exigencies of our anomalous position in which we have been placed by the action of the American Medical Association. Recognition has been extended to us upon the standing of the few, and not upon the attainments of the entire profession. We have many liberally educated men in our ranks who possess only the one degree, and these men have, with those medically educated, stood sponsors, so to speak, for the whole profession. We ought not to place ourselves too highly upon our sudden elevation to a prominent position, but should, in view of our many deficiencies, resolve to acquit ourselves of the confidence reposed in us. In order to do this it is absolutely essential that the college term be extended to three years. It is not a matter of degrees, but qualifications. We may educate every student so that when he receives his dental degree he shall be qualified and receive recognition as a specialist in medicine. The only way to accomplish the much needed extension of time required for graduation in dentistry is for the profession, through its societies and journals, to demand that the schools of the country extend the time and raise the standard for graduation.

That the profession is desirous of such an advance is evidenced by the resolutions that have been passed, this present summer, by the Illinois State Society, the Connecticut Valley and the Massachusetts Societies in union meeting—by the Maine State Society and the New Jersey State Society. The hearty reception given President Fundenberg's address before the Pennsylvania State Society showed the sentiment of that organization, and we have no doubt that if such a resolution had been presented that it would have been passed without any difficulty.

Previous to the passage of State laws looking toward the regulation of dental practice, our colleges were amenable to no power save themselves. The establishment of State Boards of Censors, in

a certain measure, put a stop to the indiscriminate granting of degrees. It is true that a college may grant a degree, but such degree no longer carries with it the license to practice, unless the State Board of Censors in the State where the individual shall elect to locate shall see fit to honor the degree; otherwise, he must come before the Board and pass such examination as they may choose to prescribe for him. They have almost arbitrary power in the matter, consequently the colleges do well to consult the wishes of the National Association of Dental Examiners. They have more power than the National Association of Dental Faculties. The latter may suggest; the former, demand. The much needed extension of time will come with better grace if suggested by the colleges themselves, than if they are compelled to adopt it at the demand of the profession. The PRACTITIONER has determined to keep up the battle-cry in this direction, until some marked step in advance is obtained. We mean, if possible, to start the ball rolling and get a free expression on the subject. We cannot ignore the question, but must face it manfully. It is either advance or retreat. We occupy an anomalous position, and must decide one way or the other. Some will not admit these alternatives, but hold that we shall remain a separate profession. Such a position is, however, in the present state of affairs, logically untenable, for it would require the dismissal of medically educated teachers from our dental faculties; and that would surely be retrogression. No, there is only one way, and that is to advance—advance, for such is the spirit of the age.

The demand for higher education is met by the statement from the faculties that they cannot make “bricks without straw.” Give us better material, say they, and we shall turn out better men. The rejection of unqualified men lies with the schools themselves. Many a good dentist is spoiled in the making—the requirements are too light—honors too easy. Students, as a rule, do work only sufficient to obtain their degree; but do the work they will, no matter what it is. They must meet the requirements in order to obtain the right to practice dentistry and a sufficient number will meet the demand even if they have to study three years. Those who will not are the very ones we can best afford to lose from the ranks. We want ambitious men, and none others. Dentistry pays those who follow it as a profession sufficiently well to recompense the best educated men to take it up as a life work. It pays

much better, considering the class of talent engaged in its practice, than does law or medicine. Once place the requirements for matriculation and graduation on the same plane as the other professions, and a different class of men will necessarily engage in the ranks. It is just as honorable a calling as medicine, and more so than law; and the only reason it is not so considered is because of the fact that comparatively uneducated men may enter its ranks. The spirit of unrest that pervades the profession to-day bespeaks an advance all along the line. The public demand it of us, because they compensate us fully for our services.

Let us therefore raise the standard and purge our ranks of incompetent men.

CONSERVATISM AND RADICALISM IN MATTERS OF DENTAL EDUCATION.

The foregoing may be a radical stand to take, nevertheless we think that when individual interest is left out of account, all will admit it to be correct. Those who stand on the side of advance and morality always have the best position. "Esey does it, guv'nur," is the motto of the obstructionist. The foes of progress are always advising us to "go easy," and oftentimes they are so anxious lest we may mar something that they really over-exert themselves trying to restrain the radicals, as they call those who advance advanced ideas.

Conservatism is often good in business and in politics, but we fail to see its applicability in matters of education. The question, Is it expedient at present to extend the time required to obtain a dental degree? is only another way of asking, Can we afford to take such a stand, knowing that unless it is generally adopted it will cut down the number of our students? The word "expedient" is therefore to be applied only to the interests of the few, and whenever such an argument is advanced, it ought to be understood in the right way.

Conservatism in the question of higher education means forethought for individual interests, and not a care for the best good of the public. Selfishness and individual interests are the main springs of human existence.

Our college faculties are conservative, because they are private institutions, and as such, the only way to convert them is through

State laws. True, we have high-minded men in the profession who are willing to sink individual interests for the general good. But it is equally true that most of our colleges are conducted on purely business principles, and that the pocketbook is consulted rather than the good of the profession. And again, just in proportion to the interests at stake—that is, the larger the number of students a college has—so will that college be slowest in adopting any measure which looks towards reducing the number of students. Here is an example of what we have just said: A resolution was brought up by a junior member in the faculty of one of our most prosperous colleges, looking towards extending the course of instruction to two years, of seven months each.

The motion was lost however, because of the opposition of one of the oldest members of the faculty, who argued that they could not afford to take the lead in the matter. The question was lost, not on the ground that the increase is not needed, but because the faculty feared that their revenue might be reduced, and therefore it was not “expedient.” It is time that the profession at large demand that our colleges be conducted in the interest of the profession, and not in the interest of the few. The only way to strike at the root of the evil is to see that no person connected with educational institutions is appointed upon our Boards of Dental Examiners. But, it is argued, the class of students presenting themselves is not capable of meeting the requirements of a more rigid examination. “You cannot make silk purses out of sow’s ears,” is a favorite saying of one of our most prominent educators. What is wanted is to weed out the “sow’s ears.” The profession can do much in the matter of selecting the class of students that shall present for matriculation. With regard to the standard of medical matriculants, Dr. J. E. Garretson says, A full one-half of the young men who come to Philadelphia to study medicine should be turned “about face,” and sent to a village school.”* Another writer † says, “The place to intercept incompetents is at the entrance of medical schools, not at the end. The profession is not thoroughly awakened to the necessity of arresting the course of the schools that are annually sending forth thousands of improper persons to practice on the community. The diploma of schools should be beyond sus-

* Exchange.

† New England Med. Monthly.

picion. The signatures should do more than convey the intelligence that the holder of a certain certificate has paid his money for a course of lectures and thirty dollars for the engrossed parchment attesting same. It does little more just now."

We fully concur with Prof. Garretson upon this point. But if such is the condition of those who apply for admission into our medical schools, what must be the proportion of dental applicants that should be returned to their preliminary studies? The time to begin the reformation is at the selection of matriculants, and the time for its completion is when the final examinations are made.

Unless the colleges adopt some uniform rule regarding time and attainments required for graduation, the matter will be taken up by the different States. Thirty-four States have at present statutory enactments looking towards the regulation of dental practice. These enactments are becoming more and more rigid as the people are better informed regarding the need of such laws.

THE 20TH ANNUAL MEETING OF THE PENNSYLVANIA STATE DENTAL SOCIETY.

The Pennsylvania State Dental Society held its annual meeting at Philadelphia, June 5th, 6th and 7th. Although occurring at the busiest season for city dentists, yet the attendance was very good indeed, especially at the afternoon sessions. Owing to the enforcement of the rule restricting the privilege of the floor to members who had paid all arrears, invited guests and non-residents, the membership was considerably increased. An amusing incident occurred when the editor of one of the dental journals published in the city, not knowing of the arbitrary resolution, attempted to make some remarks. He was called to order by the President, who said that the gentleman would have to pay his annual dues before he could proceed. The doctor marched up heavily and paid his fees, and as his speech was short, it cost him about three dollars per minute. It remains to be seen whether such resolutions will not, in the long run, react upon the society. The success of all public bodies depends upon their liberality and public spirit. A resolution that deprives an association from the benefits of outside instruction by allowing none but members to address it marks of narrow-mindedness. Under the restrictions adopted the Association shut itself out from deriving any benefit from the other professions.

no matter how desirable it might be to have such addresses. Too much time was given to the consideration of constitution and by-laws, and doubtless served to keep many away from the meetings. The address of the President, which appears elsewhere in this number, should be read. Dr. Fundenberg has grasped the vital question of the day, and his remarks should receive thoughtful consideration by the profession. Prof. Truman sounded a warning note in regard to the use of gold, and the decadence of manipulating ability. His paper brought out plainly the methods practiced in the three dental colleges in Philadelphia. Dr. Register, however, proved the dark horse of the convention, and won praise for his well-timed words regarding the necessity of a knowledge of the histological structure of the teeth. No one suspected him of having a presidential bee in his bonnet, and he says that he had not thought of it, but nevertheless, the Association elected him president for the ensuing year. Dr. Faught's paper contains much food for thought, and, as Dr. Truman remarked, if the figures were not before us, it would hardly be possible to believe that the writers in the profession were so few. Dr. Kirk's paper was a classical presentation of the subject of implantation, based upon personal experience in over thirty cases. Dr. Pierce brought out the subject of impaction of the third molars, and the causes which led thereto, prefacing his remarks by a brief summary of the genesis and eruption of the permanent teeth. Dr. Magill's and our paper completed the list.

Perhaps the most enjoyable feature of the session was the excursion down the river to Fort Delaware and return, on the steamer John Walton. Two hundred invitations, including the wives and lady friends of the delegates, had been issued. The fair sex responded to the invitation, and appeared greatly to enjoy the afternoon's outing. Dr. Allen and son and Dr. Parr, of New York, were guests of the Association. A string band and the Harmonia Glee Club made sweet music, and lemonade without any stick was dispensed with a prodigal hand. An elegant supper was served on the lower deck, and was fully enjoyed. After all had finished, the audience adjourned to the spacious saloon, and listened to a clear and entertaining explanation of the points of interest that so thickly stud the banks of the historic Delaware. Dr. Kingsbury fairly outdid himself as he warmed up to the narration

of the exciting events of our national history, and demonstrated that a good after-dinner speech may be made without the flow of champagne. On the whole, the reception was one of the pleasantest in which we remember of ever having partaken. It was the generous gift of the profession of Philadelphia to the visiting members from other portions of the State.

THE following resolution looking toward instructing the National Association of Dental Faculties was unanimously passed by the union meeting of the Conn. Valley and Mass. Dental Societies :

WHEREAS, The standard of dental education is constantly advancing, and the demands for higher attainments made upon the members of the profession are becoming greater each year ; and,

WHEREAS, The time required to complete the course of instruction in most of our colleges is so short that it is impossible for the average student to meet the requirements and do justice to himself ; and,

WHEREAS, It has been proven feasible by actual experiment in several of our dental colleges to lengthen the time requisite for graduation ; therefore, in the interests of higher education and uniformity in the degree, be it

Resolved, That it is the sense of this union meeting of the Connecticut Valley and Massachusetts Dental Societies that the National Association of Dental Faculties be, and is hereby requested, to adopt as a requirement for graduation, three full years' study, two at least of which shall be spent attending lectures, in separate years, at some regular school, whose required term shall not be less than seven months.

A similar resolution was also passed by the New Jersey State Society, and the Maine Dental Society. The Illinois State Society has also passed a resolution recommending a three years' course. These general expressions of the leading societies in the country from the far east to the Mississippi Valley should have an influence upon the action of the National Association of Dental Faculties.

At the union meeting of the Connecticut Valley and Massachusetts Dental Societies the following resolutions were introduced, and unanimously adopted :

WHEREAS, Certain manufacturers and dealers in dental instruments and materials have formed a combination known to the profession as the Dental Trade Association ; and,

WHEREAS, The forming of any such combination can only be so harmful, retarding progress in the direction of higher professional attainment ;

Resolved, That we consider the forming of such combination to be a reflection on the scientific and professional character of our profession,

Resolved, That we invite all members of said combination to withdraw from the combination, and we pledge them our hearty interest and support.

Current News and Opinion.

CORRESPONDENCE.

Editor Independent Practitioner:—

In your July number I noticed a desire for squibs, in consequence of which I submit the following: In the discussions upon copper amalgams, that have appeared in dental journals of late, as well as the discussion in the Mass. and Conn. Valley Union meeting recently, I noticed that some prominent members of the profession have claimed absolute non-union between the copper and other amalgams. I have placed copper amalgam in the mouth, and topped off and contoured with a quick-setting amalgam, and obtained the most satisfactory results. The copper makes an excellent lining for sensitive and deep cavities, and when topped with a quick-setting amalgam we have a most perfect preservative filling. I have experimented with three different kinds of amalgams, or alloys, in union with copper amalgam made by myself according to Bloxam, in glass tubes and otherwise, and found absolute union. Copper amalgam can be made antiseptic by the addition of a few drops of dilute-hydrochloric acid, which has considerable affinity both for the copper and the mercury, thereby hastening amalgamation, and the chlorine uniting with the mercury to form bichloride (HgCl_2), or H_2SO_4 concentrated could be used; add common salt in excess and wash and have a good antiseptic amalgam. It would have to be used intelligently.

H. M. CLIFFORD, D. M. D.

Boston.

Editor Independent Practitioner.

DEAR SIR:—I wish to report, through the columns of your journal, a very unusual, if not anomalous, case. On June 11th I was called by John Bell, M. D., physician in charge, to see a child, born the evening before, whose jaws could not be opened. As it had been a breech presentation, and considerable force had been necessary, the doctor feared that some displacement might have occurred.

We found, upon careful examination, the parts in position, but the following conditions existing: Quite a marked protrusion of the anterior part of the sup. maxillary bones, not excessive, but making it about as long as the upper lip, the upper edge of the inf. maxillary resting against, and slightly back of, the upper, a marked recession of the chin; the whole state of affairs giving the mouth and lips somewhat the appearance of being puckered, as in whistling. A small spatula could be passed between the jaws (the mucus membrane covered them naturally) entirely around on the right side, but on the left only a little beyond the corner of the mouth; the jaws appeared to be joined.

By the exercise of considerable force we could separate the jaws in front about a line, but could perceive no motion at the joints, and we came to the conclusion that all we gained was a slight springing of the parts.

Our diagnosis was that there must be bony union between the sup. and inf. maxillary bones. The child lived just a week, and after its death we obtained

the consent of the parents to a partial dissection of the parts, when we found the bones condensed, from about opposite the mental foramen on the left side, entirely back to where the point should have been, but of which there was no trace.

The appearance was that of one bone, the perforations extending across, and with no groove or depression to mark the line of union between the bones. The other parts seemed natural, the child full grown and healthy.

Dr. Bell says the knee of the child rested directly under the chin at birth, and the father informs me that they lost another child in conjunction when the mother was about three months advanced in her pregnancy. She starved herself very much during this time with her teeth, and would, as he expressed it, "continually grate them together in her sleep." We very much desired to prosecute the case for more thorough examination and deposit in some museum, but it was impossible, without resort to such means as are almost out of the means here.

H. D. BROWNELL, D. D. S.

GEDON HARBOR, Mich., July 16, 1888.

NOTE.—These communications are not what we wanted. Who will be the man to send us something?—EDITOR.

BIBLIOGRAPHICAL.

THE SUPERIOR INCISORS AND CANINE TEETH OF SHEEP. By FREDERICK MARK. With two plates. Reprinted from Bulletin of the Museum of Comparative Zoology at Harvard College. Vol. XIII, No. 9. June, 1898.

The work reported in this memoir was done under the direction of Prof. F. L. Mark, and reflects credit upon the laboratory. The writer draws the following conclusions from the study of a long line of serial vertical sections made through the superior maxilla from the median line backwards, and including the primolars (I): "that in the embryo sheep at a certain stage of development the dental lamina exists throughout the canine and incisor regions of the upper jaw. Its anterior portion, which is last to develop and the first to abort, does not attain so prominent a condition as its lateral portions. After advancing in development for a time, it retrogrades, and finally disappears (II); that in the canine the dental lamina gives rise to an enamel organ which never reaches a stage of functional activity, for neither are its central cells transformed into a diffuse reticulum, nor do those of the malpighian layer ever produce enamel, and in later stages both disappear.

"In this region there is no trace of a dentine germ. The lack of the enamel in sheep of rudiments of such organs as usually result in the formation of teeth is of interest because it is one of those peculiar structures for which it is difficult to account without the aid of the theory of natural selection. From the observations here recorded one readily sees that the disappearance of the superior incisor and canine is progressive. In the region of the incisors the rudiments even of the beginnings of tooth development have almost disappeared, the region of the first incisor being the least differentiated portion of the tooth, while the canine region is represented by a rudimentary large but functionless enamel sac. Since in some ruminants rudiments of incisors small rudimentary

canine teeth are found on the upper jaw of the adult animal, it is a fair inference that the teeth are being lost from before backward, and that the canine teeth, the last to disappear from the sheep, are in such cases undergoing degeneration, although not wholly functionless.

“If it is admitted that the history of the development of the individual reproduces, at least in part, the history of the ancestors of that individual, and that the changes in development take place in the same order as in the ancestors, then we have reason for believing that the progenitors of the ruminants possessed incisors and canine teeth on the upper jaw; that these teeth becoming, perhaps by a change in environment, no longer necessary for obtaining food, have gradually ceased to develop, and that the disappearance of the teeth has been a progressive process, beginning with the middle incisors and gradually involving the teeth farther back.”

CAMBRIDGE, September, 1887.

ABOUT RAILWAYS.

Scribner's Magazine is publishing a series of very interesting railway articles, and from them has been derived the following questions and answers which convey a great amount of useful information:—

Q. How many miles of railway in the United States? A. 150,600 miles; about half the mileage of the world.

Q. How much have they cost? A. \$9,000,000,000.

Q. How many people are employed by them? A. More than 1,000,000.

Q. What is the fastest time made by a train? A. 92 miles in 93 minutes; one mile being made in 46 seconds, on the Phil. and Reading R. R.

Q. What is the cost of a high-class eight-wheel passenger locomotive? A. About \$8,500.

Q. What is the longest mileage operated by a single system? A. Atchison, Topeka & Santa Fe system, about 8,000 miles.

Q. What is the cost of a palace sleeping car? A. About \$15,000, or \$17,000 if “vestibuled.”

Q. What is the longest railway bridge-span in the United States? A. Cantilever span in Poughkeepsie bridge, 548 feet.

Q. What is the highest railroad bridge in the United States? A. Kinzua Viaduct, on the Erie Road, 305 feet high.

Q. Who built the first locomotive in the United States? A. Peter Cooper.

Q. What road carries the largest number of passengers? A. Manhattan elevated railroad, New York; 525,000 a day, or 191,625,000 yearly.

Q. What is the average daily earning of an American locomotive? A. About \$100.

Q. What is the longest American railway tunnel? A. Hoosac tunnel, on the Fitchburg railway, ($4\frac{3}{4}$ miles.)

Q. What is the average cost of constructing a mile of railroad? A. At the present time about \$30,000.

Q. What is the highest railroad in the United States? A. *Denver & Rio Grande*, Marshall Pass, 10,852 feet.

Q. What are the chances of fatal accident in railway travel? A. One killed in ten million. Statistics show more are killed by falling out of windows than in railway accidents.

Q. What line of railway extends farthest east and west? A. *Canadian Pacific railway*, running from *Quebec* to the *Pacific Ocean*.

Q. How long does a steel rail last, with average wear? A. About eighteen years.

Q. What road carries the largest number of commuters? A. *Illinois Central*, 4,828,128, in 1887.

Q. What is the fastest time made between Jersey City and New Francisco? A. 3 days, 7 hours, 32 minutes and 16 seconds. *Special Transcontinental Train*, June, 1886.

EYE INFLAMMATION DEPENDENT UPON LESIONS OF DENTAL BRANCHES OF THE FIFTH NERVE.

Dr. F. W. Marlow reports three cases illustrating the dependence of eye inflammation upon irritative lesions of the dental branches of the fifth nerve.

The following is a summary of his paper:—

1. The inflammation was most marked at the margin of the cornea. 2. The conjunctival affection was limited to congestion and slight swelling, there being no discharge of matter. It would thus seem probable that the conjunctival symptoms were simply secondary to the corneal. 3. The corneal affection was quite superficial, but extended over a considerable area. In the first case it much resembled that seen in inherited syphilis. In the two last cases there was a tendency to loss of epithelium. Thus it differed from the ordinary phlyctenular type of keratitis, which tends to be more definitely localized in one or more spots, and to be accompanied by well marked inversion, and the development of blood-vessels on the cornea.

4. In all the cases there were variations in the condition from time to time, the symptoms never entirely disappearing (with the exception of those of the left eye in one case), in spite of the hygienic use of the nasal tract and general treatment.

5. When the dental irritation was removed, the eye-symptoms disappeared rapidly and completely in each case, and so far without relapse.

There can be little doubt, he says, that the removal of the dental irritation and the disappearance of the eye-symptoms stood to one another in the relation of cause and effect, and he thinks it may fairly be said that the dental irritation aggravated and prolonged the eye-inflammation, if it did not, as he now seems very probable, constitute the original exciting cause of the trouble. If we admit, he concludes, that the condition of the teeth influenced the eye-trouble in any way in these cases, it becomes evident that a dental lesion, no slight, or at any rate not of a nature to call attention by symptoms to itself, may yet be sufficient to exact such no inhuman. —*Medical and Surgical Reporter.*

TRANSPLANTATION OF BONE.

H. M. Sherman briefly reviews this important and interesting subject, and reports two apparently successful cases.

He regards the following cases of importance: That a perfectly healthy bed of granulations must first be secured—preferably by means of iodoform gauze packings. The grafts should be taken from the bone of some young and rapidly-growing animal, and from as near an epiphysis as possible, that the utmost vital action may be secured. They should consist of both bone and periosteum, and perhaps even cartilage of ossification may be of advantage. Their maximum size should not exceed one-third of an inch in length and one-quarter of an inch in breadth. Grafting has been successfully done with human, kid, and dog bones. These are probably the best sources. The grafts should be so planted that they will have free vascular connections on all sides, for such was their condition before transplantation. This may be accomplished by incisions into granulation beds. The grafts must be held down by *moderate* pressure, so that they shall not be forced from their location by newly-forming granulations.

Strict, but not too powerful, antiseptics should prevail, so that the discharges may be kept at a minimum and sweet.

The dressings should not be changed more often than is necessary to secure this desideratum; hence, should be large and very absorptive —*Pacific Medical and Surgical Journal*, January, 1888

PECULIAR METHOD OF THE TRANSMISSION OF SYPHILIS.

Teplachine writes of a peculiar Russian custom. Among the peasantry many explain almost every affection of the eyes as due to the presence of foreign bodies between the lids, where such bodies may be retained. In order to extract them the tongue of some person is introduced between the lids and into the conjunctival sacs where the supposed foreign body is lodged. The procedure is very widespread, and, as may be readily understood, syphilis may in this way very easily be transmitted. The author describes a veritable epidemic of syphilis in the government of Wiatka. Within two months he had in his hospital eight cases of syphilis of the lids (with mucous patches, also, of the anus and genitalia). The relatives of the patients themselves stated that the syphilitic virus had been thus inoculated by a woman of the village that everybody thought a female physician. The author examined this woman, and found upon her all the symptoms of syphilis. He also discovered in the neighboring hamlets sixty-eight syphilitic cases, amounting to thirteen per cent. of all the population, one-half of whom, or thirty-four, were inoculated by the same woman —*Wratch*, April.

CONCENTRATED SOLUTION OF BORIC ACID.

According to the Paris correspondent of the *British Medical Journal*, June 2, 1888, M. A. Cabanès in the *J. de Méd. de Paris*, April 15, has discovered a new way of dissolving a large quantity of boric acid in distilled water. It is known

that it has not hitherto been possible to dissolve more than 1 or 2.50 parts of this antiseptic in 100 parts of water, which is not strong enough completely to destroy all micrococci. The new solution is as follows: lactic acid, 120 parts; calcined magnesia, 10 parts; *aqua distill.*, 750 parts. It is possible that solutions of magnesium is formed; at any rate, there remains in solution a considerable excess of lactic acid.

NAPHTHOL β AS AN ANTISEPTIC.

In a communication recently made by Professor Roubaud to the Académie des Sciences, he states that naphthol β is an excellent antiseptic for surgical use. But what is more important, it would appear to be the most efficient agent for intestinal antiseptic, particularly on account of its slight solubility, which prevents its absorption, and allows it to remain a long time in the intestine without poisonous effects. A daily variable dose of 1 gramme of naphthol per kilogramme of weight of the animal may be administered without danger. — *Brit. Med. Jour.*, June 2, 1888.

The following officers were elected at the eighteenth annual meeting of the New Jersey State Dental Society, to serve for the ensuing year:

President—H. A. Hull, of New Brunswick.

Vice-President—S. C. G. Watkins, of Montclair.

Treasurer—George C. Brown, of Elizabeth.

Secretary—C. A. Meeker, of Newark.

Executive Committee—George E. Adams, South Orange; Oscar Kilbuck, Elizabeth; R. F. Linkey, Paterson; C. W. F. Hollbrook, Newark.

Board of Examiners—J. Hayhurst, Lambertville; A. E. Kates, Elizabeth; Frederick C. Barlow, Jersey City; James G. Palmer, New Brunswick; Frederick A. Levy, Orange.

The Missouri State Dental Association, at its twenty-fourth annual meeting, elected the following officers to serve for the ensuing year:

President—E. Q. Storons, Hannibal.

First Vice-President—T. W. Reed, Mason.

Second Vice-President—W. E. Tucker, Butler.

Recording Secretary—John H. Harper, St. Louis.

Corresponding Secretary—William Church, St. Louis.

Treasurer—James A. Price, Weston.

The twenty-fifth annual meeting will be held at Trade Springs, Warrenburg, beginning on the first Tuesday after the fourth of July, 1889.

JOHN H. HARPER, Sec. Soc.

AMERICAN DENTAL ASSOCIATION.

The American Dental Association will hold its twenty-eighth annual meeting at Louisville, Ky., commencing Tuesday, August 28, 1889.

CHAS. H. CROOKS,

Executive Secretary.

SPECIAL RATES TO THE JOINT MEETING AT LOUISVILLE.

One and one-third fare rates have been secured over lines belonging to the—

SOUTHERN PASSENGER ASSOCIATION,
CENTRAL TRAFFIC ASSOCIATION,
TEXAS TRAFFIC ASSOCIATION, and
THE TRUNK LINE.

The Chesapeake & Ohio Railroad will sell round-trip tickets for a single fare from Washington, Richmond, Charlottesville, and all points on their line.

Tickets on sale August 24, 25, and 26—good till September 10.

In order to secure the benefit of the reduction in rate, a certificate must be obtained from the agent at the time of purchase. These, when signed by the Secretary of the Dental Association, will entitle the bearer to a return ticket at one-third rate. Tickets are non-transferable, and good for return only over the same route traversed in going.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The National Association of Dental Faculties will meet in a fifth annual session at the Gault House, in the city of Louisville, Ky., at 9 A. M., on Monday, August 27, 1888.

In order that this meeting may be dispatched before the Southern and American Dental Associations get to work, it is hoped that the entire membership may be represented promptly at the hour indicated.

A. O. HUNT, President,
Iowa City, Iowa.

JUNIUS E. CRAVENS, Secretary,
Indianapolis, Ind.

THE NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The next meeting of the National Association of Dental Examiners will be held in Louisville, Ky., on Monday evening, August 27th, at 8 o'clock, and at other times during the week, between the sessions of the American and Southern Dental Associations. It is important to have every State Board represented.

FRED A. LEVY, D. D. S., Secretary.

PEROXIDE OF HYDROGEN.

Maklakoff recommends peroxide of hydrogen, not only as a therapeutic agent, but also for diagnostic purposes. This is because of its peculiarity of penetrating the interstices of tissues during the period of its decomposition. It thus becomes a powerful antiseptic remedy, and in setting free large quantities of gas it renders visible the spaces, furrows, etc., that one would not see, and whose existence would otherwise be unsuspected.—*Med. Russe, January, 1887.*

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NOTE.—No paper published or to be published in another journal will be accepted for this department. All papers must be in the hands of the Editor before the first day of the month preceding that in which they are expected to appear. Extra copies will be furnished^{free} each contributor of an accepted original article, and reprints, in pamphlet form, may be had at the cost of the paper, press-work and binding, if ordered when the manuscript is forwarded. The Editor and Publishers are not responsible for the opinions expressed by contributors. The Journal is sent promptly, on the first day of each month.

Original Communications.

IMPLANTATION OF HUMAN TEETH.

(Younger's Operation.)

BY EDWARD C. KIRK, D. D. S., PHILADELPHIA, PA.

READ BEFORE THE PENNSYLVANIA STATE SOCIETY, JUNE 8, 1888.

The operation of implanting natural teeth in artificial sockets formed in the alveolar ridge is still in the experimental stage, but enough has been done to throw some light on the questions of its expediency, utility, and possible permanency. The operation as devised and performed by Dr. W. J. Younger differs in its essential details from the somewhat analogous operations of transplantation and replantation by virtue of its distinguishing characteristic, viz: the making of the socket by operation. To what extent the artificial socket is a factor in the production of a successful result cannot as yet be definitely stated; it is believed, however, by those who look upon the operation with favor, that the making of a

socket artificially, contributes to its success, and possesses a decided advantage over the planting of teeth in natural sockets, which are, or have been, the seat of disease.

Younger's method of performing the operation is to make a linear incision through the gum and soft tissues down to the alveolar ridge, then with a sharp chisel carefully dissect the periosteum from the bone on either side. The soft tissues form a flap, which, when the tooth is finally inserted, encircles it, and helps to hold it in position. The socket is formed in the bone, first by means of a graded set of trephines, which are then followed by spirally cut burs or reamers adapted in size to the dimensions of the root to be inserted. The tooth is prepared for introduction by removing the pulp through the apical foramen, which is sufficiently enlarged for the purpose, and filling the pulp-chamber and canal with gutta-percha, and the apex with gold, which must be smoothly finished. The tooth is then subjected to the action of a mercuric bichloride solution, 1 to 1,000, for fifteen or twenty minutes, at a temperature of 108 or 110 deg. F., which completely sterilizes it. The socket is carefully washed out with warm water to remove all debris, and then with pledgets of cotton, saturated with the bichloride solution. The tooth is then inserted, and if necessary, retained by ligatures. Union generally takes place within a few days, and at the expiration of a week, the ligatures may be removed. The rapidity and manner of the process of repair varies greatly in different cases, and so far as a limited clinical experience can determine, seems to be dependent upon two sets of causes. First, the care as to certain details and manner of performing the operation; and second, the patient's condition of health.

The first factor, viz.: the manner of performing the operation, exerts a marked and decided influence upon the healing process, and probably upon the final result. It must be borne in mind that a body foreign to the tissues is introduced; foreign, because devoid of vitality, and which may become an irritant of sufficient intensity to defeat the object in view, by inducing such a high state of inflammation as to cause suppuration, if not sloughing, or at least failure to unite. Our object is, therefore, to so control the inflammatory process which the irritation of this foreign body has set up, that it shall not at any time exceed the degree necessary for repair of the wound, and a complete encapsulation of the root.

The method pursued by the writer, and which differs in some of its details from that of Dr. Younger, is briefly as follows:—An incision is made through the gum with a small “incisome,” and the periosteum reflected from the bone in the same manner as that followed by Younger; the process is then entered, and a cut made through the bone the desired depth, with a wide and rounded spear-pointed drill, mounted in the Bonwill engine, having a driving wheel of the largest diameter. The drill is flat, about three thirty-seconds of an inch in diameter, and sharpened in a keen edge. Having a speed of from 10,000 to 30,000 revolutions at command, the cut is made instantly and almost painlessly. The drill cut is followed by coarse-cut reamers, of which I use two sizes, the larger having five, and the smaller, four very sharp cutting leaflets, winding spirally about the shank. With these instruments the socket is formed. I was led to the use of these coarse-cut instruments by finding that those with shallower leaflets became clogged and heated while cutting the bone tissue, thus needlessly prolonging the operation, and greatly increasing the pain. I find that the coarse-cut reamers obviate these objections entirely, and by running the engine at a high speed, cut very smoothly, and with but little jar, on the same principle that the coarse teeth of a rapidly run circular saw will cut a smooth surface on a board. The socket should now be carefully washed to remove all debris left by the burs, as the smallest speck of bone or other foreign matter will increase the amount of irritation and subsequent inflammation, and add greatly to the discomfort of the patient, while at the same time retarding the process of repair. The preparation of the tooth is the same as that pursued by Younger as far as the filling of the root is concerned. The sterilization is effected in a special apparatus devised by myself for the purpose. It consists of a rectangular copper box, nickel plated, with a hinged lid perforated with three holes for the reception of three glass vessels, in one of which may be placed mercuric bichloride solution, 1 to 1,000, in which the tooth is placed for about twenty minutes before it is inserted; in another, a somewhat stronger solution, about 1 to 500 for instruments, and in the third, ordinary distilled water.

When forming the socket, great care must be taken to leave sufficient thickness of gum tissue on the labial or buccal aspect of the socket, and to avoid puncturing it at this point. If only a very

thin covering is left for the root on its buccal or labial aspect, the distention of the tissue on that side of the socket, caused by the introduction of the root, is apt to strangle the circulation of the part, and result in partial or complete absorption of that portion of the socket wall. Should the outer wall of the socket be accidentally punctured, failure to unite at that point will most surely follow, and leave a denuded patch of the root exposed to view, which not only presents an unsightly appearance, but to a considerable extent endangers the permanency of the result.

My first case of implantation was performed November 30, 1886. The patient, a lady about thirty years of age, had lost the first superior right bicuspid ten years before. A suitable tooth was treated and implanted after the manner of Younger; union took place by first intention, and at the expiration of three weeks, the tooth was in no way distinguishable from the other teeth. A noticable feature of this case, and one which has occurred in a majority of the cases of the writer, is that on the third or fourth day after the operation, a considerable exudation of plasma took place under the gum margin, in the tissues around the neck of the implanted tooth, forming a distinct ring and giving a thickened appearance to the gum. This thickened ring, which, during the first week or ten days, was quite soft to the touch gradually became harder, until finally it became rigid and unyielding, and presented to the touch all the physical characteristics of a bony callous. Upon percussing the tooth with a steel instrument, a peculiar and distinct resonance, totally different from the rest of the other teeth, was evolved, the impression produced being that of a bony ankylosis or direct union with the ridge without any intervening membrane. That this was the case is still further indicated by the fact that such teeth are perfectly devoid of that slight mobility common to normal teeth.

The condition just described has, with two exceptions, been typical of thirty-three teeth implanted by the writer up to the present time, and so far as a close clinical observation of each case can determine, seems to be the normal process of repair of the tissues in implantation.

When we consider the process by which a wound of the tissues involved in the operation of implantation is repaired under normal conditions, and in which we do not have to deal with the tooth as

a factor; the rationale of the method is easily understood. Immediately following the incision, an exudation of leucocytes or so-called plasma cells takes place; these become organized and develop into connective tissue with its capillary blood-vessel system, following which, in bone, a deposit of calcified material takes place, and ossification ensues through the agency of the osteoblastic cells which belong to the connective tissue group.

Under unfavorable conditions, that is, where from any cause the irritation is sufficiently great to set up and maintain for a time a high state of inflammation, giant cells or osteoclasts are developed, and absorption takes place through their agency until the cause of the irritation is completely removed. It is possible for the inflammatory process to abate and a normal condition of the tissues result, whereby the reparative process first alluded to will follow even after a considerable degree of absorption has taken place.

In view of the foregoing considerations, therefore, it is of the greatest importance that in all cases of implantation, the inflammation caused by the operation, and to a certain degree maintained by the presence of the tooth, which acts, or may act, as an irritant, should be kept within the narrowest possible limits to insure the very best result in each case; the means for accomplishing this may be briefly summed up as follows:

FIRST—The careful selection of a tooth, nicely adapted to the case, and having its pericemental membrane intact, and its proper preparation, by removing the pulp and filling the chamber and canal. The latter may be accomplished by enlarging the apical foramen or cutting through the palatine surface, but if by the former, special care must be exercised in finishing the final gold cap, so that it shall be absolutely free from roughness or projecting points that may become the cause of irritation.

SECOND—The formation of the socket with sterilized instruments, as carefully and as rapidly as is consistent with thoroughness. Following this with the complete removal of every particle of debris, and the sterilization of the socket and tissues surrounding it.

THIRD—The absolute sterilization of the tooth as before described, and the maintenance of antiseptic conditions around it, and throughout the oral cavity, by the use of plaster collars or the equivalent, until repair has been completed.

The last fifteen operations which I have performed have been

done under the influence of cocaine as a local anæsthetic. The action of the drug in these cases has been so satisfactory that in no instance where it has been given time to act, has any pain whatever been felt. The method which I pursue is to inject into the gum tissue in a line with the proposed socket, from a half minim to a minim of a fifty per cent solution of cocaine hydrochlorate. The full anæsthetic effect is reached in about ten minutes, when the tissues can be cut and the socket formed entirely without pain. The reason for using so strong a solution is that it requires about a quarter of a grain of the cocaine salt to produce a sufficiently profound effect. The tissues being rigid and unyielding, it is difficult to inject a larger quantity of the solution which would be required if a more dilute solution were used.

I have had no unpleasant results, either local or general, from the use of the drug in this manner, nor does it seem to have any effect whatever upon the process of repair. It renders the operation absolutely devoid of pain, the only disagreeable feature complained of by the patient being the slight painful sensation produced by the introduction of the hypodermic needle. This, however, is but momentary.

Whether this operation will become one of the recognized procedures in operative dentistry or not, will depend upon the measure of success attained, and just what constitutes a successful operation of this sort is an open question; that failures do occur from absorption of the roots of the planted tooth we are all aware. This loss of the tooth may occur at variable periods of time, ranging from a few months to several years, but the same thing, that is, absorption of the root, occurs in normal teeth, and is frequently due to causes which we are unable at present to fathom. Compared with many of the other operations that are performed for the conservation of the natural teeth, the record would seem to afford a conclusion favorable to implantation.

I have, out of thirty-three operations which I have done, lost three teeth, two of which were in the same mouth, that of a young man suffering from secondary syphilis, of which I was not aware at the time of operating. This case I reported in the *Dental Cosmos*.

The other case in which the tooth was lost was that of an apparently healthy young man of fine physical appearance, for whom I implanted a left superior cuspid in October last. He reported to

me last week that "while biting a hard crust of bread, he felt the tooth suddenly break with a noise" which he described as "like a pistol shot." On examination it was shown to have been largely attacked by osteoclasts, which had formed deep, bay-like excavations in the cementum and dentine, and which had weakened the tooth to such an extent that it had sustained a transverse fracture, at about the middle point of its length, from the force incident to masticating a rather hard bread-crust.

It is, perhaps, worthy of note that in both instances where the teeth were lost, absorption had taken place about six months after implantation.

The following extract from a note from Dr. H. C. Herring, of Concord, N. C., for whom I implanted a superior lateral incisor, so well represents the case from the standpoint of the patient, that I take the liberty of reading it:

"There was the slightest pain during the operation. No subsequent soreness until the afternoon of the 20th. It was nothing similar to periodontitis; but a soreness analogous to an insect bite, without any swelling or visible inflammation. It had entirely subsided by morning. The eighth day I removed the ligatures, as they were causing trouble to the gums of the adjoining teeth. Since then it has given neither annoyance nor trouble. Upon the other hand it has always felt perfectly comfortable. It is now as firm as the others, and while I do not subject it to any hard usage, yet I am sure it can do the work of the others. It has turned about two shades darker, but is still about one shade too light. As compared to a partial plate, I do not regard the operation as the "lesser of the two evils," but a real boon, a God-send. And he who will throw away his partial piece or tear out an anterior bridge and avail himself of this, well ? surgical sniguns, will rise up and call it blessed. I am so delighted; if needs be, I would willingly submit to the operation every six months."

What will be the final status of Younger's operation ? is a question that can only be decided by the crucial test of time and experience. All innovations have, throughout the world's history, been met by opposition and adverse criticism, which have served the purpose of stimulating their champions to greater endeavor or resulted in their defeat, and Dr. Younger's operation has not been an exception; it is still in the probationary stage, but at the same

time gives much promise of occupying a high place in the catalogue of future dental operations. It has been called "unsurgical," because it is unique; but the highest ideal of surgery is or should be conservative, and it reaches its fullest expression when we save an injured member or restore a lost one; the amputation of a limb and the extraction of a tooth are practical confessions of surgical defeat. It has been fully demonstrated by Younger, and those who have followed him, that without regard to any accepted theory of the past, teeth may be planted after his method and become firmly fastened in the alveolus by some means sufficiently strong to perfectly fulfill the requirements of normal teeth, at least for a time.

The discovery that Dr. Younger made and had the courage to promulgate should entitle him to the honor and thanks of every man in the dental profession who has the advancement of his calling at heart. He has done all that any man can up to date in the matter of demonstrating, by his operations in this line, what was heretofore unknown and even believed to be impossible. That it shall prove to be a final success is desired by every one, as no method of restoring a broken dental arch to usefulness and symmetry by artificial substitution bears favorable comparison with it; and if time shall show that implanted teeth can be retained but two or three years as a maximum limit, I should not hesitate to recommend and practice it after the satisfactory experience I have had in its performance, because, by the methods which I have detailed, it is nearly painless, the ordinary operations of filling far exceeding it in this respect, and I also believe it to be free from danger.

ERUPTION OF THE PERMANENT TEETH.

BY C. N. PEIRCE, D. D. S.

READ BEFORE THE PENNSYLVANIA STATE SOCIETY, JUNE 6, 1888.

In writing of and tabulating the eruption of the permanent teeth, it is a matter of considerable clinical interest to recognize the early date at which these teeth begin their dentification; so that it may be recalled when teeth are met with in which calcification is very imperfectly performed. It has been shown that as

early as the fifteenth week of embryonic life, preparation is made for the development of the four first permanent molars; and following close upon these, in the sixteenth week, is the induction giving rise to the enamel-organ for the twenty anterior permanent, the successors to the twenty deciduous teeth; and from this period until the birth of the infant the germs for twenty-four of the permanent teeth are passing through their several progressive stages preparatory to receiving the salts of lime. At birth the child then has not only the twenty deciduous teeth largely advanced toward calcification, but has the germs of twenty-four permanent teeth, in twelve of which calcification commences the first year. The germs of the second permanent molars make their appearance the third month, and those of the third molars (wisdom teeth), the third year after birth.

The permanent teeth, unlike the deciduous in embryo, are constantly subjected to the influence of morbid systemic conditions during the periods of calcification, and any abnormal nutritional influence of even a few weeks' duration, if occurring during the period of coronal calcification, is sure to make an impression upon the crowns of the teeth which are at that time undergoing this process. Markings or structural defects are located at the point of calcification, and limited in extent or modified by the severity and duration of the systemic abnormality occasioning it.

If any serious nutritional disturbance occurs prior to the fifth year, the defect will be observed upon the incisors and first molar crowns, varying in location with the age and advancement of calcification. If prior to the seventh and after the third year, it will be seen on the crowns of the cuspid, bicuspid, and second molars; occurring between the eighth and twelfth years, it will probably produce some malformation of the third molars. This influence of the general health upon the teeth, inducing flaws of conformation, may be assigned as a very important factor, favoring the premature loss of the third molar, development of which proceeds or is protracted through a period of childhood, when the system is liable to frequent and prolonged attacks of malnutrition, which must unavoidably interfere with perfect calcification.

While the permanent teeth in their eruption rarely produce such suffering and disastrous consequences as frequently accompany temporary dentition, there are times when the cuspid and bicus-

pids are so retarded in their eruption by either the persistence or the premature loss of their deciduous predecessors, or by a contracted condition of the maxillary bones, that serious trouble results. From induration of the gums or non-absorption of the anterior portion of the ramus or tuberosity the first, second, or third molar may also be the cause of much local inflammation and a febrile systemic condition; and this is especially the case where there is an impacted third molar.

As early as the twenty-fifth week of foetal life, the calcification of the enamel and dentine of the first molars begins; the first year after birth the central and lateral incisors begin calcification; at four years of age the cuspids, bicuspid, and second molars begin calcification; at eight years of age the third molars begin calcification; from the sixth to the seventh year, the four first molars are erupted; from the seventh to the eighth year, the four central incisors are erupted; from the eighth to the ninth year, the four lateral incisors are erupted; from the tenth to the eleventh year, the four first bicuspid are erupted; from the eleventh to the twelfth year, the four second bicuspid are erupted; from the twelfth to the fourteenth year, the four cuspids are erupted; from the twelfth to the sixteenth year, the four second molars are erupted; from the sixteenth to the twentieth year, the four third molars are erupted.

It will be seen that by the commencement of the sixteenth year that permanent dentition is completed, with the exception of the third molars or wisdom teeth. The variability of these is great, for while they are not unfrequently in position by the seventeenth year, they are often unerupted at the twenty-fifth, or sometimes delayed until the thirtieth or fortieth year. In this greater delay the absence of room in the arch is usually the cause, and not until some of the more anterior teeth are extracted and the walls absorbed do they make their appearance. The cuspids and second bicuspid are also less uniform in their eruption than the incisors. This may be due to either the persistence or the premature loss of their predecessors. If the deciduous cuspid be prematurely removed, the first bicuspid, which makes its appearance two years before the permanent cuspid, will move forward and take its position adjoining the lateral incisor. This necessitates the delay of the permanent cuspid some months, and when it does erupt it must encroach either on the labial or palatine surface. A similar condition results from the early loss of

the second deciduous molar. The first permanent molar coming through the gums more than four years before the second bicuspid, the premature loss of the second deciduous molar would enable the first molar to occupy the space which should be protected for the bicuspid, and force the calcification of the latter to be completed beneath the crown of the first deciduous molar, or else occupy a position encroaching upon either the buccal or the lingual territory.

The associate lesions of second dentition are regarded as of trifling importance, yet not unfrequently do conditions exist at this period of the child's life which result in serious constitutional disturbance.

A want of correspondence between the growth of the root and the removal of the superimposed structures may result in stomatitis, enfeebled digestion, impaired nutrition, and fever. Wherever the terminal branches of the trifacial are distributed suffering, severe and protracted, though quite remote from the seat of the disturbance, will, until the cause is removed, baffle the best efforts of the physician. The persistence of either the inflamed and swollen or the indurated gum over the crowns of the advancing first, second or third molars, retarding their eruption and pressing the sharp edges of the calcifying roots back into the unossified pulp or formative papilla, cannot do less than encourage, if not produce, disorders of too serious a nature to be disregarded, and second to those of first dentition only because the increased age has lessened the child's liability to disease and increased its nutritional advantages and its resisting power. An impacted third molar at the base of the coronoid process is capable of giving as much excruciating and permanent suffering as it is possible for human nature to endure. Indeed, there is no abnormality or lesion coming in the province of the oral surgeon which demands more prompt action, or for the time more thoroughly taxes to the utmost his best judgment and skill. The removal of the anterior molar is often indicated for the purpose of giving relief; indeed, when the third molar is unbedded so that it cannot be reached, it is the only remedy.

The cause of this serious abnormality has never received the attention it deserves, and has been looked upon as a break of nature rather than as a natural result of some potent cause.

The impaction of the third molar, so much to be dreaded in certain constitutional predispositions or idiosyncrasies, is invariably

the result of one of three important factors, heredity, variation from some nervous impression, or external action or want of action, with its accumulated influence which we may term function of teeth and maxilla. The tendency of children to inherit physical peculiarities from ancestry, both near and remote, is so well established that it needs no argument to enforce it.

The influence the nervous system exerts upon the teeth and jaw is certainly well attested by their concomitant variations with the greater or less nervous energy displayed. The period of life when the brain is overtaxed or unduly stimulated, when the irritability of the nervous system is prominent in every act or movement, is a period well marked by inharmony of function and imperfect physical development.

Recognizing the fact that the trigeminus, in the fulfillment of its functions, regulates the nutrition of the tissues to which its terminal branches are distributed, we can readily appreciate the following statement made by the late Professor Anstie: "The nervous center in which the trigeminus is implanted is, of all nervous centers, the one which, in the human subject, is most liable to congenital imperfection of the kind which necessitates a break-down in its governing functions at special crises in the development of the organism." Dr. Kingsley, in his work on Oral Deformities, says: "No author on the causes of malposition of the teeth has made this direct connection between the abnormality and a disturbance of the nerve-center during the formative and eruptive period, but I find a large array of facts, confirmed by my own observations, which, in my mind, point to this conclusion only, and although other observers of similar facts have attempted, in many instances, an explanation of what they saw, they have failed to refer them to any satisfactory *primary* cause."

The influence exerted by action or want of action, use or disuse, would come under the head of "functionally produced modifications;" that these do occur every observing biologist who has written within the last century, certainly recognizes. The decrease in the size of the jaw of civilized man from that of the uncivilized or lower races is well attested, and the cause of this change in size, or modification in development, can only have resulted by or through the agency of two important factors, with their cumulative influences—decrease of function and diversion of nutrition. The mod-

ification in diet and stimulation of the brain necessarily lessen development in the one, and by diversion of nutritive current vitiates the other. A change of habitat, which involves new food, different temperature, drier soil, must produce a corresponding change in the digestive, respiratory and vascular systems, and these of necessity must, in time, result in modified structural conditions.

The foregoing has a direct bearing upon the question of the retention or extraction of the sixth-year molar. We are more or less in the dark regarding the etiological factors operating to cause the loss of these teeth. There are some cases where if we could but look into the future for two or three years we could save the patient intense suffering; sometimes lasting days and even months. I speak of those cases of impaction of the third molars where necrosis results. Most notably in the lower jaw. These cases can be accounted for in that the jaws of the higher races have shortened while the size of the teeth have remained relatively the same. In such instances no alternative presents but to extract some line or more of the permanent teeth in order to prevent untoward results. Such cases are not unfrequent, and prove the exception to the rule, advanced by some, to always preserve the sixth-year molars. There are conditions of inherited tendency to disease, such as scurvy, etc., where we may predict the probable impaction of the third molar, especially if there is any history of a hereditary tendency toward impaction, where it would certainly be better to take out the sixth-year molar.

OUR DENTAL LITERATURE.

BY L. ASHLEY FAYOULT, D. D. S.

READ BEFORE THE PENNSYLVANIA STATE SOCIETY, JUNE 8, 1898

Upon the cover of one of our journals we find these words: "Observe, compare, reflect, record." A glorious and effective motto! How has it been heeded by the profession?

The statistics I have to present shall be the evidence, and you, yourselves, shall be the judges.

For several years I have followed and compared the writers and writings found in the dental journals, to note the progress of dentistry. In my studies of the contributions they found, it has seemed to me that chaff exceeded wheat, and volume exceeded value.

I admit that a repetition of old ideas is needed, for some men require to have a new idea stated to them about twenty times before it is registered in their sensorial consciousness, and I sincerely believe that an article full of originality is seldom grasped in its entirety on its first publication. I would, however, advocate the relegation of repetition to the lecture desks of colleges or to the covers of adequately prepared text-books.

The students of the profession should be trained by our present college chairs, or by the establishment of a new one—that of dental literature—in all that has been presented to the profession, by all writings up to date of graduation. It should be the work of the professors or professor thus to send them forth fully acquainted with the past, and fully prepared to comprehend and contribute to the writings of the future. Journals, then, need contain only that which is new, since their last, and up to their immediate date of issue. Under this condition of affairs, practitioners would eagerly look for them, and turning their pages over and over in study, would thus keep upon the crest of the wave and ever be ready for progressive work. The occupants of professional positions, securing this material as it in turn became old, would incorporate it into their lectures to the coming recruits.

In order that this retrospect may not become too voluminous, I will confine my observations to the *Dental Cosmos*, as a typical journal, and to the years 1872 to 1887, inclusive.

During the last seven of these years, the character of the material presented has improved in scientific quality. This is not a mere impression, but a truth arrived at by careful comparison. Because of this marked contrast and for other satisfactory reasons, I shall present my statistics in two divisions, covering periods of nine and of seven years, respectively.

After carefully enumerating and tabulating, I have discovered that of the twelve thousand dentists in the United States, only three hundred and thirty-four, in those nine years, have contributed anything to its pages; and even this small number is attainable only by including every member reported as having made remarks in any dental society!—though he may only have said, “Those are my sentiments,” or “I agree with the previous speaker.”

Twenty-five of the contributors did more than one-third of the work, and fifteen of these occupied positions as teachers in dental

institutions. From such we naturally expect to hear, as they are supposed to be gathering material in their experimental work as instructors. Can it be possible that there were only ten active minds in the private ranks of the profession of dentistry? And yet it seems but reasonable to infer that workers will desire the widest promulgation of their labors.

Making an exception of two serials, which were copyrighted for publication afterward, as text-books, I have also found that the number of subjects thus presented during this time is one hundred and thirteen, which may be classified as follows: Theoretical, sixty-eight; relating to materials and drugs, twenty-five; manipulation, fourteen; pathological and therapeutical, six. By this classification it will be seen that the bulk of the matter was theoretical, and which, even if handled in a masterly manner, is, at best, of questionable value.

The subjects receiving the most attention were: "Sixth-year Molars," "Eclectic Dentistry," "Neuralgia," "Caries," "Conservatism," "Doctor," "Pulpless Teeth," "Exposed Pulp," "Sensitive Dentine," "Contour Filling," "Creosote," and "Amalgam."

Let us consider the second period, from 1881 to 1887, inclusive. This should claim our especial interest, as it covers a period intimately connected with the present.

Counting in the same way as before—including all who gave the sound of their voice at a reported dental meeting—the number contributing during these seven years is two hundred and ninety-seven. Of these, thirty-two have done more than one-third of the work, nine being in professorial positions. The active workers, quoted in the *Cosmos* during this time in the private ranks, were only twenty-three.

The number of subjects presented during these seven years is one hundred and two, and may be classified as follows: Theoretical, forty-two; relating to materials and drugs, fourteen; manipulation, fourteen; pathological and therapeutical, thirty-two. The subjects receiving the most attention, stated in this instance, were: "Crown and Bridge-Work," "Dental Caries," "Equalizing Teeth," "Filling Teeth," "Pulpless Teeth," "Dental Literature and Education," "Amalgam," and "Prosthesis."

Comparison between the latter seven years and the former time shows a slight increase in the general workers, and a marked in-

crease in the *active* workers in the private ranks. This has of course been naturally accompanied by an increase in the number of subjects treated, and their nature has also changed.

Theory still leads the list, though the proportion of interest in it is slightly decreased. Materials and drugs and manipulation receive about the same attention; while the trend of pathology and therapeutics is decidedly towards an advanced position.

The most marvelous thing, however, revealed by the analysis of the past seven years is the fact that the profession, as represented by its writers, has devoted the greater proportion of its powers to the study, development and consideration of crown and bridge-work. This subject has had prominence and preferment above every other subject. The discovery of this fact gave your essayist much food for meditation, as it probably will many of you; for, in his opinion, the profession has devoted too much valuable time to what is not calculated to be of general, every-day practical benefit; but adapted to very special practice, and therefore rather limited in its usefulness.

It is a matter of every-day remark, by many supposed to be informed upon the subject, and whose opinion is of value, that a dentist to be truly scientific must be medically educated. They would lead us by their remarks to infer that the thinkers and writers of the profession were those who held the title M. D. in addition to D. D. S.

The facts, so far as I can obtain them, show that the thinkers and writers holding the two titles are but thirty per cent. of the whole number. I must admit, however, that as a rule the most scientific literary work has been done by this thirty per cent., but I do not attribute this advanced condition to the M. D. title, or believe that it is the essential factor to a high character of work. The title is the effect and not the cause, obtained for the reason that the possessor loves educational advancement. What I do believe, and what I would especially advocate as necessary to advanced thought, is a trained mind. It is the one thing essential.

If we desire to improve the character of our dental literature, it is to be done by raising the standard of dental education. The point at which to start is at the beginning—at the basis of admission of students to dental colleges. It ought to be required of those seeking the title of D. D. S. that they should give unques-

tionable evidence of a certain previously acquired educational advancement before they are admitted to enter upon the study of dentistry. Their minds should be disabused of the idea that they can study dentistry without much previous education, and this fullness, position and prominence, if desired, is to be had after the acquirement of D. D. S., by simply adding M. D.

To recapitulate: It has been shown that the character of our dental literature has improved in its scientific character in the last seven years.

That the subjects treated are not excessively practical, and the topic most considered during that time is not one fraught with the greatest good to the greatest number.

That the bulk of writing is done by graduates of dental colleges only.

That the number of active workers—doing most of such work—is exceedingly small, and out of all proportion to the large number engaged in dental practice.

And that the road to improvement lies in admitting men inducted at the outset with a desire for educational advancement.

In conclusion, I trust that those who have been reading with the blissful feeling that they were progressing will reflect upon the points I have mentioned, and will remember that if our journals do not bring us new facts in the future, the fault is not with the editors, but with ourselves.

IRREGULARITIES AND THEIR CORRECTIONS

BY W. E. MAGILL, D. D. S., BRIDG, PA.

READ BEFORE THE PENNSYLVANIA STATE SOCIETY, JUNE 7, 1895.

When irregular teeth are presented for examination and advice, the first question to decide is, whether you had not better let them alone. This is the question of questions, upon the wise decision of which may depend your reputation, your own comfort for a considerable period; and not only the comfort, but also various important influences in the life of your patient.

No hasty conclusions should be adopted. Nature can do wonders, and may be competent, if given time, to right all that seems wrong.

To one who feels able to cope with mechanical difficulties, this

department of practice is fascinating; and the greater the difficulties presented, the more absorbing becomes the interest of the operator. To bring order out of chaos, to introduce symmetry where distortion has prevailed, to establish beauty in the place of homeliness, is no mean ambition; and the man who succeeds in so doing may well be called and possess the true spirit of a reformer.

When satisfied that no intervention is needed, it then becomes your duty to make plain as possible to the patient the grounds of your decision, the reasons for your opinion. This is very important when you advise delay, for a little dissatisfaction with your course, coupled with impatient desire to be good-looking, may send your patient to Dr. Forceps, who is always ready to advise and take the short-cut of extraction, because it brings the certainty of cash in hand.

When you have decided that interference is necessary, you have reached the foot of the hill "Difficulty" only. The full responsibility of a careful diagnosis is upon you, and "to pull or not to pull" is] often a very important question. Irregularity usually presupposes want of room, and continued want of room is a barrier to success in any attempt to regulate. My own experience tells me that at this critical time we are likely to fail for want of a thorough examination and consideration of each case in all its bearings. We may undertake to spread an arch when better articulation could be more easily secured by extraction, and all other benefits as surely gained or retained, as they could by long and laborious—perhaps painful—interference.

It is possible for us to start out with an exaggerated estimate of the value of the individual natural tooth. This is all right when viewed from the side of conservative dentistry, or when a comparison is drawn between the natural organ and an artificial substitute; but it is out of place when interfering with a proper procedure to secure the greatest good to the greatest number. As in civilized society, the interests of the individual give way when they contravene the public good, so the value of a single tooth is more than counterbalanced by the importance which attaches to the other members of the arch.

We are under obligations to take the best, the most direct, and least painful plan. If that involves the extraction of a tooth, we should have no hesitation about its removal. The attempt to force

teeth into positions where room has not been provided, this failure, protracted efforts and pain to the patient, without the encouragement of success. Sometimes, too, this mistaken economy results in successful enlargement of the arch, but away from proper antagonism to the opposing arch, and outside the line of beauty for the mouth. Then there is the ever-present tendency to retreat, always more powerful where abundant room is not secured: the necessity of wearing a retaining device for a long time, and sometimes the annoying experience of seeing, ultimately, the teeth in their old position.

In this early diagnosis the condition of the alveolar arch is a very important consideration. If it is in good form and width as compared with the opposing arch, and if, in the main, articulation is good, the irregularity consisting in the deviation of a few teeth from their proper position, the probability is that judicious extraction is the short and direct road to success. Not necessarily the removal of all that are out of line, perhaps none of those that are irregular. Sometimes irregularity of the bicuspid, or even of the cuspids, may be satisfactorily remedied by the removal of a defective molar. This plan may require the additional use of appliances, but be justified by the exchange of a diseased tooth for one that is sound. It has become a settled and, I think, a wise practice, to preserve the cuspids, as more important, and extract one of the bicuspid, in those common cases where, all the teeth being sound, the cuspids have developed outside the arch. Some operators, however, do not hesitate to extract the cuspids. If this is done as the result of ignorance, such ignorance is culpable—the practice is certainly in violation of good taste.

The literature of our profession proves that experience has given us established rules of practice, some of which have crystallized into principles for general application. I refer with pleasure to the work of Dr. Kingsley, entitled "*Oral Deformities*," and to the more recent publication, "*American System of Dentistry*," and what is there presented under the title "*Orthodontia*."

It is generally conceded to be good practice to postpone serious and extensive interference, with a view to regulate teeth, until the complete development of the permanent set, save the third molars. I think we may adopt the rule that no considerable force should be applied to a partly-developed tooth to drive it into proper position.

In the case of upper teeth developing inside the lower arch, I would fit a plate with biting blocks, to give room; and rely upon mere guidance or impingement upon the palatine surface of the coming tooth, leaving to nature the application of force.

I have been much interested in irregularities caused by disease of the investing membrane. This usually consists in a movement to the right or left, in cases involving front teeth; but the movement of molars is usually in the line of pressure from occlusion. Incisors sometimes elongate, and sometimes the side movement continues to the extent of overlapping a neighboring tooth. In these cases mechanical appliances may be used as aids, the true corrective being treatment of disease in the tooth socket.

Judgment is shown in the selection, and skill in the successful application of the appliance selected. I have but little to say of appliances, however, because our professional museum is so well stocked that American ingenuity would deserve high rank if judged alone by devices to regulate teeth.

It has been reported of Archimedes that he said he could, with his lever, move the world if only a sufficient fulcrum could be furnished. The dentist, too, has serious thoughts about a fulcrum when he is trying to move a bicuspid towards a molar and finds the accommodating molar rapidly approaching the bicuspid, while the latter remains in situ. For such cases I think we yet need a pulley and tackle combination, or a device which shall give the short arm of a lever to the bicuspid and the long arm to the molar.

I am in favor of intermittent force in moving teeth, for the following reasons:

1st. It involves less pain for the patient, or, what is equivalent, gives periods of rest and relief from soreness.

2d. It is the safe plan, for it is but seldom that we can move a tooth without some irritation of the investing membrane. If we limit movement we may limit irritation, and therefore have less anxiety about the case when the patient is beyond our reach.

3d. It gives time for the natural process of repair. It is of no value to move a tooth so rapidly that in its wake shall develop an open fissure.

Therefore, for power, for ease of control and convenience, preference should be given to the screw or wedge, or combinations of screw and wedge, or screw and lever.

Reports of Society Meetings.**ILLINOIS STATE DENTAL SOCIETY****TWENTY-FOURTH ANNUAL MEETING.****REPORTED FOR THE INDEPENDENT PRACTITIONER.**

BY C. N. JOHNSON, D. D. S., D. D. S.

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THURSDAY EVENING SESSION.

A paper by Dr. L. P. Haskell was then read: "Prosthetic Dentistry—Some Difficult Cases and their Treatment." He said that if the conditions of all mouths were similar and equally favorable, the insertion of dentures would be a pastime to the experienced dentist. It is not so, and the unfortunate thing is that patients will not recognize this. First study all unfavorable conditions, for no matter how long we practice, new combinations will present themselves. If the case is difficult, first impress the patient to this effect; control the patient, or you cannot properly control the mouth.

In cases where all the upper teeth are out, and all the lower except the anterior ones, the patient cannot successfully wear the upper plate without lower back ones, as the constant pressure in front will cause absorption of the process, and leave a rolling ridge of gum in the anterior portion of the upper jaw.

Where, in these cases, one or two bicusps remain on one side in the lower jaw and not on the other, remove them to get even pressure. Again, where all the upper teeth are out except the posterior ones on one side, they had better be removed, but sometimes we may clasp, and use a suction plate, leaving the teeth in.

Continuous gum is the only material where the upper jaw is prominent and the lips short.

Where all the upper teeth and the anterior ones of the lower jaw remain to gain masticating surface, put in a lower posterior set, but do not raise them high to relieve the pressure from the anterior ones, as the gums will yield and cause discomfort. In these cases it is preferable to "shoe" the front ones.

The most important thing in artificial work is the articulation.

In this connection observe three rules: Never allow pressure on the six anterior teeth; never in full upper plates have the pressure greater on one side than the other; never allow the second or third lower molar, which has projected forward so that its face shows, to meet an artificial tooth at that angle, as it will crowd the upper plate forward.

As a rule, a full lower plate is more useful and comfortable than a partial, because the pressure is equally distributed over the whole jaw.

DISCUSSION.

Dr. E. D. Swain—This is an important question to us as a profession. It would seem as though it had been tabooed of late. Nothing new has been given us for years, except artificial crown and bridge-work. It has been neglected in our schools. Students are not properly instructed on this subject, and much that is erroneous is taught them. In regard to difficult cases and how to overcome them, we should first consider the diagnosis of the case, and study it well. Get a correct impression in plaster of paris. The most difficult cases in which to get a perfect impression are those having uneven surfaces, soft in one place, hard in another. In such cases scraping the model is not efficient; few men have nicety of judgment sufficient to do this accurately. I take an impression in wax, then trim it out and use it for a cup, in which I take a second impression in plaster.

Other difficult cases are those in which the alveolar process is absorbed in front, especially in the upper jaw. The ridge is loose and flabby, and in taking the impression it is pushed out toward the lip. In these cases cut the forward projection from the model, and add wax to the ridge to reproduce the natural form of the mouth.

Lower partial plates are usually discouraged by dentists, and it is true that they are sometimes very troublesome in our hands. A rule that I have followed with success in partial and full lower plates, is to cut away till I feel sure I have destroyed it, and then cut away some more. I do not hesitate to use clasps in these cases, even if I know the tooth will be ruined in four or five years. There is more benefit to the patient from the successful use of the plate than from the tooth clasped.

The essayist placed stress upon the excellency of continuous gum-work. There is no question that it is the cleanest and best material, with the possible exception of all-porcelain. Continuous gum is

sometimes too heavy, bungling and clumsy, and the dentist should discriminate as to the material. Rubber has been of much value, and cast metal plates have their place, so that the observing dentist should know which to use.

As to the question of extracting teeth, to render an artificial denture a success, it is sometimes advisable to extract perfectly sound teeth, if by so doing we can benefit the patient.

The paper laid particular stress on the importance of proper articulation in dental substitutes, and the three rules laid down are universal.

The discerning dentist who travels, or who walks on the streets, is hurt by the artificial teeth he meets, from the manner in which they are put together. They are seldom one-third as large as they ought to be, and often point into the mouth, showing all the teeth when the mouth is open. There is no effort to build out the teeth and restore the features. Mechanically, they are all right, for if the blow comes inside the arch the tendency is to hold the plate up firmly, and they are worn with comfort. As to the satisfaction given by artificial teeth, it is safe to say that a perfectly satisfactory set of teeth cannot be made.

Dr. Taylor—There is one difficult case not spoken of: where all the teeth back of the cuspids are absent in the upper jaw. The air gets under the plate in front, and it is exceedingly difficult to keep it up. In one very stubborn case of this kind I made a deep arch-chamber, and it worked satisfactorily. It is sometimes necessary to drop out two or three teeth to make them natural in appearance, using twelve instead of fourteen.

Dr. Ames—I do not advocate the extraction of sound teeth. I believe it is unjustifiable. It might be necessary in rare instances, as in a partial case where the space is not right, and in the upper jaw where only one or two teeth remain. In the latter case we might want to shut out the air and enclose the whole ridge, but these are the only cases. I would not extract sound teeth on one side to equalize the pressure, as the upper plate can be so constructed that this is not necessary. Generally, dentists do not run an upper plate up far enough over the tubercle and not toward the malar process; and they do not arrange the teeth so that the pressure is directed toward the center of the mouth.

Another thing, where an upper plate is necessary and any teeth

are remaining, the essayist would extract. I would fill them and place the plate over them. They will sustain the pressure, and the plate will not settle. In partial lower plates let a lug run up on the grinding surface of the natural teeth so as to let the force of mastication come on them. In the case mentioned by Dr. Taylor, I would depend more on the articulation than on an air-chamber. Get a forward pressure on the plate and it will be held in place.

Subject passed. Adjourned.

FRIDAY MORNING.

The first in order was a paper by Dr. J. Frank Marriner, on "Making and Tempering Instruments." He said :

"This paper is not intended for experts, but for those who are still in the dark on this subject. The making and tempering of dental instruments seems to be considered by many an exceedingly difficult and mysterious process; but the facts are that it is very simple, and easy of accomplishment by the average dentist.

"One of Fletcher's gas or gasoline forges, No. 19, will be found useful for this purpose, especially in small forging and repairing. Instructions for its use may be found in Fletcher's catalogue of 'Laboratory Apparatus.' It costs, with foot-blower, blow-pipe, and rubber tubing complete, about eighteen dollars. This, with a medium sized anvil and several hammers of different sizes, make a respectable outfit. If a man has a decided taste for this kind of work he may procure other appliances that will be of value, but for the ordinary dentist who wishes to make a new instrument only occasionally, this is an unnecessary expense, as he can accomplish his purpose with one of Fletcher's solid flame burners, No. 46, costing two dollars. Use with this a good mouth blow-pipe, and it will prove very efficient. In forging, the first thing is to have in your mind a perfect conception of the instrument you wish to make. Exercise care in heating, as steel is injured by too much heat. Do not use the hammer before the requisite temperature is obtained, and distribute the force as evenly as possible; that is, turn the steel at every blow, striking first on one side, then on the other. Always keep vividly in the mind's eye the form of instrument you wish to make, and conform every blow to this idea.

"Of course, in making small instruments, as thin scalers, excavators, etc., the forged instrument will be two or three sizes larger than needed when finished. Be sure and leave it large enough for grind-

ing, but endeavor to be as exact as possible in regard to the form. Hammer it into shape rather than use the file, as the instrument will be tougher, more springy, and have a better cutting quality.

" When the instrument is formed, use fine sand paper or emery cloth to remove the effects of the heat. This must be repeated at every subsequent heating. It is now ready for tempering. Use the solid flame burner with the blow-pipe. Gently rotate the instrument in the flame till it reaches a bright cherry red, then quickly plunge it into cold water. If you are in doubt as to the temper, test it with a file. If it is too soft, clean it as before and repeat the process, carefully observing the heat for a higher temperature. The beginner may have to repeat several times.

" With the instrument highly tempered, go over it again, using sand paper, etc., to remove the effects of the heat, being careful not to break it, as it is, in its present state, capable of little resistance.

" The next step is to draw the temper, so that we may have a spring at the neck and shank, leaving sufficient hardness at the cutting edge. To do this, force the blade into a piece of soft pine about an inch square, and throw a flame from the blow-pipe upon the larger part of the shank till it assumes a blue color. As the color passes up the neck, if the point in the wood be small, stop it just before it reaches the wood; but if large, let the color run to the wood, and then check it instantly. This will give a strong shank, spring temper at the neck, and keen cutting edge that will not crumble or turn in cutting tooth substance.

" In tempering long bladed instruments, such as scalars, extractors, etc., do not force more than one-third or one-half of the blade into the wood, and as the color passes over the neck and down the blade arrest it in a bright straw color just before it reaches the wood. This gives a spring temper throughout.

" Now comes the important point of grinding the instrument. Keep the stone wet and place the instrument on the stone in precisely the position that you wish it to remain throughout the grinding. On removing for any cause, be particular to return it in the identical position it occupied before. In this way you can grind a delicate instrument accurately; and delicacy is of the utmost importance. Not one dental instrument in ten is made small enough. They are clumsy, and they are not tempered properly. They are too rigid. We want instruments that will cut tooth substance and

not batter it down by force. As an example in fine instruments, compare Dr. Cushing's scalers with those usually found on the market, and when you have used the Cushing scalers once, you will wonder how you ever succeeded with others."

DISCUSSION.

Dr. Cushing—There is hardly any discussion necessary, as the paper covered the ground completely, and gave good instructions. I might say a word or two as to the importance of the dentist being able to make his own instruments. This accomplishment is more valuable to the country dentist, who is removed from the depots. Many times an instrument will break, and if he has only one of that kind, he is often obliged to do his work with one not adapted to the purpose. If he could make his own instruments he would not be caught in this dilemma, as one who understands well how to make an instrument can do so in five minutes.

Most dentists who are in the habit of making over instruments usually make poor ones because they have not studied the nature of steel. There is not one in ten, of those who handle steel, who is thoroughly skilled in regard to tempering. The manufacturers all fail to give us the kind of instruments we need. I seldom buy hatchets or small excavators but that I have to temper them; they may be of good shape, but are not well tempered. As an illustration of the necessity of understanding the metal upon which we are working, I remember when in California many years ago, in the mines, we had to have our picks sharpened often, and we invariably went to a blacksmith ten miles distant, in preference to those living nearer, because he always sharpened them just right. He understood his business, and they did not. He studied how to manage steel. There are no two lots of steel exactly alike, and each lot must be manipulated differently. All the steel in one lot is alike, and we must learn by experience how to treat that lot. This was the secret of the blacksmith's success.

The principal points in making instruments are : First, do not overheat; the instrument may easily be spoiled by this. It should not be carried beyond a cherry red in forging. Never go to a white heat; it is better to reheat often rather than heat too much. Keep turning the instrument when forging so as to render the steel compact. Do not spread it out too much or it will not be homo-

geneous. In tempering, heat to the lowest possible degree that will harden the steel. Usually this will be a low cherry red, but sometimes you will have to carry it to a brighter red. Then, for drawing the temper place the end of the instrument in a piece of wood, and heat till the blue runs up to this. Grind your instrument down, and you will then have a better one than you can buy.

I would emphasize the necessity for having more delicate instruments. The ordinary hatchet excavators are too clumsy. Better work can be done with greater comfort to the patient by the use of thin instruments, and they will last well if tempered in this way. Do not expect one of these instruments will stand what a large pick will; they are not for breaking down, but for cutting tissue.

One word of advice—have a good sized whetstone, and use it often. With dull instruments you only rasp the tissue off. Small stones are useless, as a groove is soon made in the centre. Use a broad stone where you can sweep across a large area. Arkansas stone is the kind to use. The point is to resharpen often. I have been annoyed very much in the clinic room at the college to note the indifference of students in this regard; and the majority of practitioners have the same careless habit. Use keenly sharp instruments.

Dr. Ames—I would like to ask Dr. Cushing what the color of the point is in drawing the temper?

Dr. Cushing—The same as before; you do not wish to draw the temper at the point.

Dr. Ames—Then a good article of steel is not brittle when hardened?

Dr. Cushing—If you heat just to the point of hardness, and not beyond, you get hardness without brittleness.

Dr. Morrison—I have been much interested and benefited by the paper. I am astonished at the condition of the instruments in many offices. When an instrument breaks it is sometimes a good thing, as a better one can be made on the handle.

I would make one issue with the paper, that the instrument should be shaped more with the hammer than with the stone. The advantage is that the very compression you have made will leave the outside shell a little harder than the rest. Now, in shaping the blade, forge down to a sharp edge; sharpen it with the hammer. Use absolutely cold water in hardening. To draw the temper, instead of wood use tin or lead. Sink the end in lead and carry it

over a Bunsen burner. You can watch it better than with the blow-pipe. Give a straw color just where it enters the lead.

Regarding drills for retaining pits or removing fillings, when a small bur breaks, shape it, temper it, and use it for these purposes.

Dr. Cormany—I should advocate the use of soap in tempering. You will get better results by its use than by any other method.

Dr. Taggart—There is a little work published by the Crescent Steel Co., Chicago, on the manipulation of steel from a scientific standpoint. It is for free distribution, and is a valuable work, well worth reading and studying.

Steel should be worked properly from the beginning. When you break an excavator and have difficulty in tempering it, the fault may be in the original working.

Yellow soap with rosin is best for tempering. Smear it over and the scale will not form; you will have a smooth surface. If you want a really hard instrument, plunge it into mercury.

Dr. Wassall—There is one method of heating not mentioned, that is, in superheated lead. To temper Swiss broaches, place them in one of Williams' cylinder bottles, with an opening in the cork so the bottle will not burst. Then heat gradually, and you can watch the color of the broaches. I would ask the essayist what kind of a grindstone he uses?

Dr. Marriner—Corundum.

Dr. Cushing—In reply to Dr. Morrison, I think it is a fallacy not to grind the instrument after heating. I have been informed by a gentleman who understands perfectly the working of steel, that this is one of the most important points.

Dr. Ames—Since Dr. Taggart has given us such an admirable machine for making corundum points for the engine, it will be found more advantageous to use these in grinding instruments, where fine work is required.

Dr. Crouse—Mr. President, I don't wish to make a speech on the subject before us, but I do want to compliment this body on the work they have done at this meeting. It does my soul good to see the members of this society earnest in trying to help each other and the better to fit themselves to practice dentistry.

To know how to practice dentistry in the most perfect manner certainly is a laudable ambition, and that seems to be the aim of these meetings. If the community depending upon us for good

service could understand what real honest work this society is doing, they would surely rejoice, and our recognition would be quite as great as though we had spent the time in trying to find out whether or not we are medical men, or whether our standing in the community is as high as it should be.

Subject passed.

Dr. Patrick then made some impromptu remarks on "The Rationale of Constructing and Attaching Artificial Crowns to Natural Roots of Teeth."

He said: "When we attempt to fit a band to a root, we are dealing with the base of a cone, and the farther we extend the band on the root the worse off we are. We make it more insecure because the upper end of the band is so much farther away from the root, on account of the latter being broader at the end.

"The point is to make a band that will go down as far as possible without leaving a space. To do this, bend the root a little on one side, fit the band tight, and slip it over the other side, bringing it into position on the root with a stretch. In this way a band can be placed on a root so firm as to render it impossible to pull it off by applying the force in a direct line with the root.

"Much has been said about posts. All roots have round following more or less the external form of the root, so that you have the same principle involved in this. The farther you insert a square butted post the weaker you make the root. Where there is plenty of material it makes little difference, but ordinarily the post should be made tapering.

"It is, however, seldom necessary to use posts where the bands are perfect. Many gentlemen use binding wire in measuring the root for the band. Now, the more you twist that wire the farther down it goes, so you do not get a correct measurement, and moreover, you are using a round piece of metal in measuring, when you eventually put on a flat piece. It is always better to fit the gold itself. In placing a band on an incisor, first put it over the lingual surface and force it toward and over the labial, as the pressure on the crown will be in that direction."

He concluded by saying that the roots of teeth ordinarily remain healthy a much longer time than the crowns, and this encourages us to a constant study of the best methods of crowning.

PENNSYLVANIA STATE SOCIETY CLINICS.

Dr. William H. Trueman, Master of Clinics, made the following report :—

PHILADELPHIA, June 7th, 1888.

To the President and Gentlemen of the Pennsylvania State Dental Society:—

At the clinic held on Wednesday morning, June 6th, at Sibley's Dental Depot, Dr. F. J. Richards, of Williamsport, Pa., exhibited a device fitted to a Snow & Lewis automatic mallet, designed to facilitate its use in filling posterior approximal cavities. It forms a "back action" attachment to the mallet, and is as readily attached and removed as is the right angle attachment to the hand-piece of a dental engine. It seemed to be a practical suggestion.

Mr. E. E. Clark, representing the Electro Metallic Dental Plate Co., of Newark, N. J., exhibited specimens of their work. The plates shown were made of silver, heavily plated on each side with gold; they are produced by depositing the metal by electricity directly upon the plaster model, thereby securing a perfect fit. The model, it was claimed, is not injured during the process unless deep undercuts, or the shape of that portion of the plaster model covered by the plate renders its removal without fracture impossible. The plates are intended to serve as a base upon which may be moulded vulcanite, celluloid, etc.; and are not intended to have teeth soldered to them. It was stated that an extra deposit of metal could be made at any point desired to give additional strength, to form a rim, or to form projecting points or a roughened surface to afford secure attachment for the vulcanite or celluloid. The coating of gold on either side is sufficiently thick to protect the silver from injury during the process of vulcanizing. The metal seemed to be as solid and tenacious as metal that had been melted and rolled. The company propose to make the plates only, at a cost of \$7.00 each. After the denture is finished; should the gold coating be injured at any point they undertake to renew it without additional cost, and without injury to the vulcanite or other attachment.

Dr. H. A. Parr, of New York, constructed a Removable Bridge piece for the upper jaw; attached anteriorly to the first bicuspid tooth and posteriorly to the second molar, filling the space from which the second bicuspid and first molar had been removed. The first bi-

cuspid to which the anterior end of the bridge was attached was first, by means of corundum wheels in the dental engine, reduced in size and changed in shape to facilitate fitting over it a gold cap. A strip of coin gold was accurately fitted around it and the ends soldered to form a collar sufficiently wide so that while one edge, suitably shaped, fitted just under the free margin of the gum without, however, impinging unduly upon the periosteum, the other nearly reached the masticating surfaces of the opposing teeth when the mouth was closed. Over this end was now soldered, converting the collar into a cap, a piece of gold. Before soldering this piece to the collar it was shaped to represent the cusps of a natural bicuspid by laying it upon a piece of smooth wood, the ball end of a steel instrument handle placed upon it, the instrument being held at an angle of about forty-five degrees, when a quick blow with a wooden mallet upon the ball end neatly formed a cusp. The position of the instrument was now slightly changed and another like blow as quickly formed the second cusp. A little care in adjusting this to the collar produced a masticating surface corresponding almost as nearly to that of a natural bicuspid as though it had been swaged with a die. In a similar manner the cusps of a molar may be as readily and as quickly formed. The cap was now placed upon the tooth and firmly pressed home and the patient directed to close the teeth firmly; in doing so he crushed in the thin cap of gold covering the collar so as to make, as was designed, a perfect articulation with the opposing teeth. The cap was now removed and solder flowed inside to give the masticating surface sufficient stiffness and thickness to permit, should it be necessary in its final adjustment, the removal of a portion to accommodate its articulation with the opposing teeth without cutting entirely through. By this simple method Dr. Parr constructed quickly, and neatly, an accurately fitting bicuspid cap resembling very closely in form the natural tooth, all the work being done at the chair. He then, in like manner, constructed a cap for the molar tooth. After the caps were completed, to the posterior approximal surface of that fitting the bicuspid tooth was soldered, in line with the axis of the tooth, a short cylindrical tube, into which a pin was fitted and which was afterwards soldered to that end of the bridge. To the molar cap was soldered a box about one-twentieth of an inch wide and one-eighth of an inch long, and nearly as deep as the cap was wide; into this was fitted

and soldered to the bridge a pin, corresponding in shape. In soldering the tube and box to their respective caps, care was taken to have them as nearly as possible in line, so that the pins, firmly attached to the bridge, would readily pass into them and fit tightly. When the arrangement was completed and the caps firmly cemented in place, the bridge, while perfectly firm when in place and not liable to displacement in mastication, was readily removed and replaced by the patient. The work was well done, notwithstanding the many inconveniences inseparably associated with clinical operations. Dr. Parr carefully explained each step of the process as he proceeded with his demonstration. The method of attachment was novel, and promises, where it is practical to use it, to add to the other advantages of bridge-work greater cleanliness and facility of repair.

Dr. E. Parmley Brown, of Flushing, N. Y., exhibited a number of specimens of his all porcelain bridge-work, and by means of plaster models explained his method of constructing and securing them in position. He also exhibited in the mouth of a patient a "bridged-in" bicuspid that had been in position over a year. The space to be supplied in this case was the first bicuspid of the upper jaw. Into this was fitted a bicuspid tooth (porcelain), having baked into it a platinum bar extending into a cavity made to receive it in the second bicuspid. The tooth was secured in place by first, with the electric mallet, packing gold to cover the floor of this cavity; the cervical margin was then neatly finished. The tooth was now placed in position and firmly held while gold was packed on either side and over the platinum bar, the contour of the natural tooth being fully restored. The operation was neatly done and looked well. The porcelain tooth pressing into the gum gave it a remarkably natural appearance, indeed; a close inspection was needed to detect it. Dr. Brown prefers that the teeth should press upon the gum firmly. The smooth vitrified surface of porcelain does not favor the accumulation of matter to so great a degree as does a metallic surface. He finds the work more cleanly when so arranged.

The clinic on Thursday morning, June 7th, was held at Justi's Hall.

Dr. E. C. Kirk implanted the right superior central for a patient for whom he had recently successfully implanted a left super-

ior lateral; the latter had become quite firm, and in appearance and usefulness was all that could be desired. His method of performing the operation did not differ materially from that usually pursued; first, opening from the apex of the root and thoroughly cleansing the pulp-canal and the pulp-chamber, then filling the larger portion of this space with gutta serena, and finally sealing the opening in the apex with a neatly finished filling of gold. Before commencing to operate upon the patient he injected hypodermically a solution of cocaine into the gum over the point where the artificial socket was to be made, and waited a few minutes until the cocaine had had the desired effect. He advised caution in the use of cocaine; one-eighth of a grain being the maximum amount he thought prudent to use; in some cases less will answer. The effect of the drug is not always prompt, a few minutes being required for its absorption. He would rather wait a little longer than risk using a larger amount. In this case, probably five minutes elapsed before the sensitiveness of the parts was sufficiently reduced to permit the operation to proceed. He also urged the importance of thoroughly sterilizing the tooth to be implanted, and all the instruments to be used, and keeping them in that condition throughout the operation. For this purpose he used two solutions of mercuric bichloride, a weak one in which the tooth was placed, and a stronger one in which the instruments were kept. These solutions were kept at a temperature of about 98° by means of the self-regulating apparatus designed by Dr. Kirk for this purpose, and on sale at the dental depots. He recommended that the solutions be made with distilled water in all cases, otherwise a slight precipitation of the bichloride of mercury was possible, which would impair their efficiency.

The operation was successfully performed. The patient gave no evidence of suffering, and stated that the operation had not been really painful.

Dr. A. G. Bennett, of Philadelphia, by means of plaster models demonstrated a method of securing accurate impressions in difficult cases. In cases where an isolated tooth is required, and the space is narrow, or from other causes there is difficulty in securing a correct impression of the space, he suggested first, fitting into it the artificial tooth that is to be used, in the position it is to occupy, then taking the impression while it is in place, letting it form part of the impression.

In cases where the teeth lean in excessively, he suggests building a wall, quite wide at its base, of yellow wax, upon the impression cup sufficiently high to nearly cut through the plaster (he prefers plaster for taking impressions in these cases), when the cup is pressed in place. After the plaster of the impression has hardened, the cup is removed, leaving the impression in place in the mouth. The soft wax is readily removed, and there is then no difficulty in fracturing the plaster and removing the impression in sections. The wall of wax is placed so as to divide the impression into sections convenient for removal.

He also illustrated by models a method of "cap and groove anchorage" for bridges and crowns. This is especially applicable to the bicuspid teeth, especially to those which have a cavity of decay upon one or both approximal surfaces. He first grinds enough from the palatal or lingual surface to permit the adaptation of a neatly fitting collar of gold encircling the tooth, except upon its buccal surface. He also cuts away the inner cusp sufficient to admit the thickness of the cap without interfering with the articulation of the opposing teeth, and forms across the masticating surface a slight groove in which the edge of the cap may rest. This usually converts the approximal cavities into open grooves. Should it not do so, they are so made by extending them through to the masticating surface. A gold or platinum collar is now fitted covering the lingual surface and both approximal surfaces of the tooth. This is firmly held in place while, with a pair of round nose pliers, the beaks of which are longer than usual, and so shaped that they are nearly parallel to each other when grasping the tooth, the collar is bent in on each side to fill the grooves. A little care is required in doing this to draw the collar closely to the tooth; if unskillfully done the collar will be made too large on the lingual side, and will not "hug" the tooth sufficiently close. A piece of gold is now fitted to cover the inner cusp, extending over the masticating surface to the groove made for its reception, and soldered to the collar. It is now placed on the tooth and the edges burnished closely to the tooth at all points. A staple of stiff half round gold wire is fitted over it so as to slide into the grooves on either side, in such a manner that the convexity of the wire presents on the masticating surface. He now carefully removes the cap with the staple in position and solders them together, using sufficient solder

to well fill the grooves; this not only stiffens the cap, but permits a neater finish on the approximal surfaces. The cap is secured to the tooth with zinc phosphate cement. The doctor suggests this form of cap, not only as a support for bridge-work, but also as a ready and effective method of repairing bicuspid teeth badly decayed on their approximal surfaces.

Dr. Bennett also exhibited a method of using the "Bing" style of teeth in constructing bridge-work. These teeth are merely bicuspids, and are made to closely resemble, in shape, the natural teeth; the pins are on the approximal surface of each side. In mounting them for bridge-work he first grinds away the bulging portion of the lingual surface, then fits a collar of suitable width extending around the lingual surface, and sufficiently far on each approximal surface to embrace the pins which pass through holes made to accommodate them; for convenience this collar is made in two pieces, joining about the middle of the lingual surface. When the collar is fitted and in place, the pins are seated well in by splitting them with a sharp instrument. The tooth is now invested, and the pins of each side and the joining at the centre of the collar securely soldered. After all the teeth to be used have been thus mounted they are arranged in place, the ends of the collars being filed thin, if need be, to permit the teeth to approximate, invested and soldered together. After the bridge is finished, with the electric mallet he neatly packs gold into any spaces that may exist between the teeth. This promises to be a useful suggestion. It is seemingly strong, there is no gold exposed, it is clean, and more readily constructed than the usual method of using thin porcelain facings and forming the lingual and masticating surfaces with metal.

Dr. H. C. Register, of Philadelphia, exhibited his new dental engine. This has many points of excellence that cannot, however, well be explained without drawings.

The Detroit Electric Motor for dental purposes was shown in connection with a battery designed by the Parts Electric Battery Co., of Philadelphia, especially for running motors.

Dr. W. B. Miller, of Allama, Pa., exhibited a set of loop or band matrices which he has recently designed.

Dr. Carroll, of Meadville, Pa., successfully used a partial upper plate of his aluminium alloy, and demonstrated the use of his apparatus for that purpose.

PENNSYLVANIA STATE DENTAL SOCIETY.

TWENTIETH ANNUAL MEETING HELD IN PHILADELPHIA, JUNE
5, 6, 7, 8, 1888.

ESPECIALLY REPORTED FOR THE INDEPENDENT PRACTITIONER.

THURSDAY MORNING SESSION.

DISCUSSION ON DR. TRUMAN'S PAPER CONTINUED.

Dr. H. C. Register, of Philadelphia—The paper has delighted me very much indeed. Dr. Truman is a very conservative teacher, consequently a good one. There can be no doubt but that other filling materials save teeth as well as gold. We see this in our practice daily, and the question naturally arises as to the forces at work to bring about the same result even when materials diametrically opposed are used. To my mind the success lies in the knowledge and skill used in preparing the cavity and choosing the material to be inserted. We should not operate upon teeth as we would upon bricks or stone. Instead of an inanimate object, we have to operate upon a highly vitalized one, that is subject to law as much as any other portion of the body. Our operations must be in accordance with the laws which govern the changes that take place if we wish success. The tooth is not a solid organ, but a most composite one. Let us, for a minute, consider the development and histology of a normal tooth. There is a central cavity, surrounded by dentine, containing pulp, nerves and vessels. Upon the surface of the pulp is the odontoblastic layer which served to develop the dentine. The latter is composed of tubuli and basis-substance. The fibrillæ take up the matter from the odontoblasts and pass it into the basis-substance. The amount of organic to inorganic material varies in an adverse ratio to the age of the tooth. It is also a well-known fact that mature teeth also vary very greatly in their density. Many operators in preparing a cavity do not take into consideration the age of the teeth or the density of the tooth to be operated upon. We are too apt to get into a groove in practice, to adopt one method and follow it regardless of the physiological conditions which are known to exist. The teeth of young persons are treated the same as those of persons thirty-five or forty years old. The main thought of some operators seems to be to make a cavity that will hold the filling, whereas, in my judgment, that should be a secondary con-

sideration. Of course we desire to have *best fillings remain in*, but in order to accomplish this we must take into consideration physiological as well as mechanical laws. No deep undercuts should be formed, but the cavity should be made slightly wedge-shaped. Where deep undercuts are made, the dentinal tubuli are cut through and the vitality of the distal ends destroyed. The distal end portion of the dentine becomes friable and is easily broken down. Frail margins arise from disregarding physiological as well as mechanical laws. Regarding filling materials, it is a well-known fact that decay does not occur under gutta-percha or cement fillings. It seems that the protection of the dentine is the secret of success in filling teeth. Soft foil should be used in the bottom of the cavity in juxtaposition with the dentine, but harder foil may be used to finish where it comes in contact with the enamel. I believe that where there is perfect adaptation between filling and tooth substance that calcification of the ends of the fibrillæ occurs, and that the surface of the dentine is better prepared to withstand decay.

In forming cavities I cut down from the crown. I do not use retaining pits. I form my cavity so that the interior is slightly larger than the outer portion, then by use of a matrix I work wax-like plastic material, finishing with cohesive foil, using a small retaining pit in the crown if necessary. A surface hardness sufficient for all purposes is thus obtained. All pure foils are cohesive, and those that are non-cohesive are made so by some addition to their composition. Almost all foils that are sold for non-cohesive can be made cohesive by heating, but they are apt to dissolve. There are certain foils, however, that contain alloy which cannot be so treated. Those that can be made cohesive have received only a coating upon the surface, and which is evaporated by the heat.

Dr. Kirk—The matter I want to speak of has been gone over largely by the gentlemen who have preceded me. I wish, however, to emphasize one or two points brought out, as they are of special interest. The terms "hard and cohesive," "soft and non-cohesive," as applied to dental gold foils, have been used as though they were perfectly interchangeable. Such use of the terms, however, is erroneous. Pure gold is inherently soft and inherently cohesive, and deviation from these conditions is the result of impurities in the foil or upon its surface. I have carefully investigated the matter myself, and have had numbers of assays made of the principal

foils in the market, the results of which work all tend to prove the correctness of this conclusion. There is no variation from this law of stability in any department of nature. For example, pure water has certain physical attributes which are fixed and invariable, such as transparency, a fixed boiling point, specific gravity, etc., which are always the same under like conditions. This same thing is true of every other element or definite compound in nature, and when we have books of dental gold foil sent us from the manufacturers, bearing on the outside statements to the effect that "this foil is absolutely pure," and then is denominated cohesive, semi-cohesive, non-cohesive, or soft, as the case may be, it certainly appears incongruous.

I had occasion while writing the metallurgical article in the American System of Dentistry, to endeavor, if possible, to ascertain the cause of the differences observed in the physical properties of dental gold foils. I purchased books of different makes of gold foil in the open market, and had them tested by the assayer of the Philadelphia mint (than whom no higher authority on this subject exists), and the results obtained were, to say the least, interesting. I found in the soft foil of Abbey, which is claimed to be absolutely pure, nearly two parts in a thousand of impurity; whether this impurity was an integral part of the foil I do not know. I do not, however, believe, like Dr. Register, that it was a surface impurity. Certainly it was not volatile, as the foil was subjected to a red heat for several minutes before the assay was made, in order that all volatile matters should be driven off. All the other foils examined were subjected to the same treatment, viz.: heating to redness before the assays were made. Of all those examined, Abbey's foil was found to be the most impure from a chemical standpoint. I found the foil made by Rowan, of Jersey City, to approach the nearest to absolute purity. This latter foil, and that of the S. S. White Dental Manufacturing Co., known as "Quarter Century" foil, contained the least impurity of any—a mere fraction of a part in a thousand. These two foils, when manipulated under similar conditions, were almost indistinguishable from each other; but between these foils and that of Abbey's there was a wide difference physically. I do not take the position that the impurity found in Abbey's foil was a detriment to it, nor would the ultra refinement of the Rowan and White foils, on the other hand, necessarily give

them a special superiority for the methods of manipulation. The two classes of foils are so entirely different, and depend so largely upon distinctive properties which they each possess, and which in the one case is dependent upon the presence of some detaching material, that a comparison as to their working value can scarcely be made.

What I wish to bring out is that the difference in physical properties is due, not to any inherent difference in the gold as gold, but to the slight admixture of some other substances which exercise a marked modifying influence upon the physical properties of the finished foil.

The difference in the kind of impurity exercises an influence on the foil fully as great as the difference in the amount which it contains. Thus, if the alloy or impurity is an oxidizable metal, the effect upon the foil is very different in kind and in degree from that produced by a union with one of the noble metals, such as platinum or silver, that are not readily oxidizable. The base metals, such as lead or tin, not only confer hardness upon the foil, but extreme brittleness. Take a foil so contaminated, and assay it as thoroughly as you please, and still I believe it is beyond the highest dental skill to make a filling with it which will be moisture tight and prevent a recurrence of decay.

As an illustration of the physical properties of absolutely pure gold, I had made at the mint a sample of gold, which the authorities there guaranteed to be absolutely 1,000 fine. I had this gold beaten carefully, and with special precautions, into No. 4 dental foil. I tested it myself in fillings, and also gave portions of it to other practitioners, and they all agreed with me as to its extreme softness and cohesiveness. It was scarcely distinguishable from the Wolrab foil, or any other absolutely pure foil. I took some sheets of it, put them into the book of a foil manufacturer, and had them assayed at the mint, and they told me it was the only sample of the lot of foils which I brought to them for examination which was absolutely pure; they having had no knowledge of the fact that they were making an assay of their own pure gold.

In view of the results which I have sketched, I cannot help feeling that much of the defective gold work that is done is, to a considerable degree, due to the hardness or unworkable character of the foils used. I am also convinced that a filling, or I will use the

term "plug" in this instance, can be made absolutely moisture tight, and permanently protect the tooth from a recurrence of decay by the use of absolutely pure gold which contains in itself the greatest softness with a maximum of cohesiveness.

This part of the subject has been well brought out by those who have preceded me, so I only arose to view the matter from its chemical aspect.

Dr. Ward—May I ask Dr. Kirk whether the impurities are in the soft foil or others?

Dr. Kirk—I had intended to state that the soft foil of Abbey has a reputation, and we all know what it will do. I do not stand here to criticise and make a point against Abbey's foil because of its impurity, because that very impurity which exists in Abbey's foil has an advantage, and I do not believe we could get the results with Abbey's foil if this impurity did not exist, because it adds a certain property to it. Nor do I say that an absolutely pure gold foil is a great desideratum. But we must know that these two words of softness and cohesiveness do belong to pure gold.

AFTERNOON SESSION.

Paper read by Dr. C. N. Peirce, on "The Development and Eruption of the Permanent Teeth."

DISCUSSION.

Dr. James Truman—Dr. Peirce has opened a broad subject, and one that has been discussed in its general details, oftentimes, I have thought, without much profit. I cannot agree with him, however, that the jaw is decreasing in size, that it follows necessarily that we must lose a tooth. You must remember that going back to the higher anthropoid apes we find their molars, bicuspid and premolars very much larger than those of the human race, and as we come up further to the cave skulls we find that while they are probably somewhat decreased in size, yet still very much larger than the teeth of an ordinary civilized individual at the present time. As man becomes more civilized, the teeth decrease in size, assuming more and more an equilibrium, consequently I do not think that it is at all necessary that the present human race should lose a single tooth for the purpose of articulation. I regard the sixth-year molar, so-called, as one of the most important teeth in the whole series—broad upon its masticating surface; it is, in fact, the key of the arch,

which, if taken out, destroys the symmetry of the arch to a certain extent, and oftentimes so seriously as to impair the occlusion, and possibly mastication. I hold that it is impossible to remove any tooth in the jaw without this following. When you remove the sixth-year molar, you necessarily throw the front teeth back, because they assume the direct vertical, and articulation is likely to be impaired. Why then remove the sixth-year molar to articulate the wisdom or third molar? Some persons entertain queer ideas regarding the loss of the third molar, simply because they are found misplaced in some individuals. It is, perhaps, only a temporary inheritance, and equilibrium is sure to come in the process of evolution. We will have irregularities during that period, but the time is bound to come when it will be found that all the teeth are necessary, and every one can be retained in its proper condition.

Dr. Guilford—As Dr. Truman has said, this is a large subject opened by Dr. Peirce, so that we are liable to take different views of the subject. It is certainly a very important matter. We must first study the etiology of this condition. It is very evident that there is a malposition in the third molars at the present time that did not previously exist. All the different writers who have written upon this subject, and have examined the different collections in the different museums, have failed to show any evidences in regard to the peculiar condition of the third molars to-day. I shall have to disagree with what Dr. Truman has said in regard to the jaws. I think Dr. Peirce is right in regard to the size of the teeth and jaw. I think the human frame is, to a certain extent, decreasing in size. I believe the maxillary bone is smaller, but we have no evidence that the teeth are becoming any smaller. You will probably remember that in the earliest recorded skulls found that the teeth were no larger than our own. In reports of examinations of the skulls in Egypt and Mount Sinai, no mention is made regarding any unusual size of teeth. The reports are conflicting also regarding the teeth of giants. In some cases the teeth are very large, and in others not. As I take it, the size of the teeth has not changed, but the jaws have. One way I come to this conclusion is in the unusual number of cases of irregularities existing at the present day. The question comes back to me, why should teeth erupt in that way? It is due, I think, to two causes. The first has been mentioned by Dr. Peirce, viz., the decrease in the size of

the jaw; the other is due to the third molars coming in at a late age. When they come in at twenty-one or twenty-two years, the processes are soft, and the other teeth are easily moved, but when eruption is retarded until the thirtieth or thirty-fifth year, the processes are then hard, and they come through with great difficulty. I remember a case quite a number of years ago of one of our members. He had a large jaw and large teeth. They were erupted too late, and he was confined to his room for two weeks, and suffered intensely. Was it due to a lack of proportions of the jaw, or too late eruption of the teeth?

Dr. Peirce spoke of anticipating this difficulty. He suggested that it was possible to foretell, in some cases, when there was evidence that there would be trouble. I do not think our foreknowledge goes that far. If the individual has large teeth and small jaws, we might possibly treat in that way, but until the time comes we do not know how far the process is going to enlarge. If it does not enlarge, then extract the second molar, as I do in my practice.

Dr. Smith—The matter of knowing what kind of a patient you are operating on is of vital importance, so far as inflammatory influences are concerned. It is a matter that should be inquired into. We cannot make a correct prognosis of any case without a good grounded history of the subject of the case. That is a law in surgery, and therefore it is better not to risk operations. We ought, of course, to mitigate the sufferings, but it is best not to go ahead without being prepared for the results. Sometimes an operation performed on the subject, without waiting further time, causes destruction of the maxillary bone. The impaction of the wisdom teeth is not, of course, a general thing, and it may be called an anomalous condition. We only find it in persons whose jaws are not perfectly developed. They are isolated cases in surgery, and I am glad to say it is not a general thing in the human family. When we look at the German race we find a development of the superior and inferior maxillary bones that is superior to the American jaws, and we can reflect it back to the manner of living. These bones may be retarded in growth by the food which is taken into the system, and by the manner of life the person leads. We find in the German jaw, and in those who subsist upon the hard black bread, better maxillary bones than those fed upon the delicacies of the

American table. We all know that in the south, among the slaves, larger bones and better jaws were found in those living on plain fare than those nourished in the houses of the planters. With regard to the sixth-year molar I believe no rule can be laid down for it. The only thing to do is to make close observation from the patients themselves, and in regard to whether these children are from scrofulous parentage or not, it should not be a matter of delicacy for the dentist to inquire into this matter. They have as good a right to inquire into the heritage of the family as the physician.

Dr. Fordham—I am a great friend of the sixth-year molar, and in my practice the loss of it has given me great annoyance, and great annoyance to my patients. I have in my mind now a physician who, when he came to me, had lost his lower sixth-year molar, and the twelfth-year molar was lying upon its side as if trying to do the work of two. As to myself, personally, I would sooner lose the twelfth-year molar than the sixth-year, for it would then leave an unbroken arch to the twelfth-year. It is well known that the twelfth-year molar is often inferior to the sixth, and unless the latter is so bad that it cannot be saved, I do not extract the sixth, but crown it, and if the twelfth is bad extract it. In those days when we can perform such almost miraculous operations, it seems entirely unnecessary to lose this sixth-year molar, taking into account that the twelfth-year molar is so apt to be inferior.

Dr. James Truman—I simply want to add to what I said before, that it seems to me that a great many persons in considering this subject take a narrow view of it. When we take into consideration that all race types—at least so far as my observation goes—are not troubled with the wisdom teeth or the sixth-year molar, but their teeth keep a normal position in the jaw in almost all cases, notably the Europeans, South Sea Islanders, Aborigines of America, etc., then it seems to me that there is a cause for this difficulty. The race here is not a true type, but is approaching one. It may be one hundred years before we reach the true American type. We are a mixed people, coming from all races. We have not reached that equilibrium that I spoke of. The time is, however, bound to come when the American race will assume its own type. It is much better than it was one hundred years back, and will be better one hundred years in the future. I do not see how we can avoid this conclusion. If we will only extend our observation to all the races of

the earth, we will not find this difficulty. It is not the proper way to look at the thing. Dr. Guilford says the teeth before were not larger. I think I can show in the caveman in Belgium that the teeth are larger all the way back.

Paper read by Dr. L. Ashley Faught, on "Our Dental Literature."

DISCUSSION.

Dr. Gerhart—As a member of the Examining Board for a number of years, it has been my fortune to look upon the writings of a great many men who come up for examination, and it has been to me sometimes a matter of great astonishment. My home is in a university town, where I have good opportunities for observation, and I have almost invariably found that the men who finish their course in that university and afterwards follow their studies in the various professional schools, have been better equipped, not so much for what they have learned there, but because of the discipline that has been received. It is the duty of the faculties of our colleges to demand of matriculates that if they have not a college education they shall have, at least, had an advanced academic course.

Dr. James Truman—It is not a subject for discussion, exactly, but I was very much pleased with the paper. I hope it will have a broad distribution. The dental profession needs it. The fact that so few have taken a part in the literary work of our profession is a disgrace to it. Every man is able to do something. We are, perhaps, guilty of taking the work of other men and putting our name to it, and sending it out broadcast. I am glad Dr. Faught has brought the matter up in the way he has.

Dr. Wm. Trueman—From the showing just made there seem so few contributors to the dental journals that I can hardly believe it. To be sure, I have noticed that the same names are repeated very often. I have also been surprised in looking over the index of the *Dental Cosmos* to find such a comparatively short list of contributors. Another point brought out was the very few original contributions. It is often hard work and nothing to show for it. We may start a series of experiments and find we have been following up a blind lead, and we must confess that there is a great deal of discouragement in this matter. I do not know how our profession compares with the medical profession. I have sometimes thought

that a little more literary talent was shown in their compositions, and that there were more contributors.

Dr. Smith—I do not see much difference between the dental and medical profession in this respect. I do not think the dental profession is much behind. I am ready to stand up for the dentists. We must remember that the dental is not as old as the medical fraternity. I think dentists have done a great deal within the last decade, at least as far as originality in their productions is concerned, but it must be remembered that writers are not altogether original, and it is clearly impossible to ask of the writer to be altogether so. We could count them on our fingers if we would have only original communications in our literature. I think we can enlarge upon other men's thoughts to good advantage, and that is what we want. We want to develop and interchange ideas. We do not want to depend upon one journal; there are other journals in this State. There are other journals that are giving good literature. We have some of the most able writers in other journals, and why do we stand and criticise dental literature by the productions of one journal. There are leading thoughts from good minds besides those found in the *Dental Cosmos*.

(TO BE CONTINUED.)

Editorial.

THE PROBABLE MANNER OF ATTACHMENT OF IMPLANTED TEETH.

The dental profession has become familiar with the operation of implantation as devised by Dr. Younger, of San Francisco, by clinics given by him and others in nearly all our prominent dental societies. The mechanical part of the operation has been fully demonstrated, and is thoroughly successful. The scientific and therapeutic part, however, and the special details that tend toward final success or failure are not so well known. Sufficient time has not elapsed since the operation was first introduced to allow of a final verdict in the case; enough, however, has been done to disprove the first assertion that the operation was unmergeral. It is true that Dr. Younger's ideas regarding the method of attachment were crude, but he had the practical experience behind him that could not be gainsaid, and which secured for him a respectful hearing from the profession. The theory of the revivification of

the pericementum was so utterly absurd that, had it not been for the practical demonstration of the fact that teeth so implanted could and did become firmly set in the jaw, it would have been sufficient to have overthrown the entire operation.

An operation that now promises to be of real benefit to humanity was introduced and held its own through merit, although based upon such an unscientific hypothesis that upon its first presentation it received the appellations of absurd and unsurgical, and the leading oral clinician in the country refused its demonstration before his students. In this age of high scientific attainments, only those operations are entertained that are based upon scientific principles. The scientific aspect is first studied out, and the operation results. The opposite was, however, the case in implantation. The method of attachment was an enigma, and different theories regarding the nature of the attachment were advanced. We were called upon early in the history of the operation for our opinion regarding it. The cases that had come under our notice were limited, and we had had no opportunity to make any experiments or histological examinations of teeth that had been implanted. Knowing, however, the nature of organization of exudated lymph, when such does occur, we said that the attachment was probably fibrous, and did not depend upon the revivification of the pericementum. Time has proven the correctness of this statement, and that such is the first stage in the method of attachment. The plasma cells that are thrown out become organized, and a firm connective tissue envelops and encircles the root. The fine processes of the cells probably penetrate the superficial lacunæ of the cementum, and in this way serve to help attach the tooth more firmly than would otherwise be the case were a porcelain tooth used. Such may be said to be the manner of attachment at the end of the first week or ten days after operation; but a second stage intervenes, provided the inflammation is kept in abeyance, when the process of ossification sets in and proceeds until the socket is filled with new formed bone, giving rise to a bony ankylosis. No experiments have been made to demonstrate the truth of this latter statement; but the solidity with which the teeth become attached, the lack of mobility and the peculiar resonant sound given off when such teeth are tapped, all tend to confirm our opinion regarding the nature of the attachment in successful cases. We have not been able

to induce any person who has had a tooth successfully implanted to sacrifice himself for the cause of science, and allow the extraction of the tooth with a portion of the alveolar wall. The cases that have been examined were where the teeth had been lost or where the operation had not been an entire success, and were, consequently, not suitable cases for investigation. We are promising ourselves this winter to make some experiments in this direction if the time can possibly be found to do so.

THE PROGNOSIS.

We look very favorably upon the operation, and consider it far from unsurgical as at present practiced by those of our acquaintances. To Dr. E. C. Kirk, perhaps, belongs the credit of doing most towards putting the operation upon a thoroughly scientific basis. He has given the subject a great deal of attention, and the operation as practiced by him seems to meet all the requirements. The success of the operation depends upon three things; first, the selection of the right kind of a case upon which to operate; second, antiseptically performing the operation; and third, the maintenance of the proper equilibrium between progressive and retrogressive forces after the operation. Under the first head there can be no question but that persons in whom there is a scrofulous or even a catarrhal tendency will make unfavorable cases upon which to operate. The first result after operation is exudation of lymph, following which one of two things occurs, the lymph either organizes or breaks down. The latter is most apt to result in individuals suffering from a scrofulous or catarrhal diathesis. The same holds good for those individuals in either the secondary or tertiary stages of syphilis. So long as there is any tendency toward retrograde metamorphosis, there can be no assurance of success. The secret lies in keeping such changes in abeyance, and stimulating the up-building process, which tends to organization. We think that the process of implantation gives much more promise of success than does re- or transplantation. The fact that in implantation we have perfectly healthy bone surrounding the root implanted is a point very decidedly in favor of a quick and favorable healing of the tissues by first intention. In re- or transplantation, an old and, in most cases, diseased socket is utilized, and if good results are obtained it is first necessary to overcome the retrogressive tendency already situated in the tissues; whereas in implantation, in fact,

able cases, nature is on our side. Then, again, the operation of implantation comes forward at a time when we are much more conversant with the physiological and pathological laws that control inflammation, and as that is one of the essential features, a knowledge of which conduces to the success of the operation, we therefore look for good and sufficiently permanent results to entitle it to a place among accepted surgical operations.

A WORD OF CAUTION.

No one can but help noticing the fact that the dentist of to-day is called upon to do more difficult tasks than formerly, and also to assume more responsibility. This is notably the case in implantation, and it may not be amiss to call attention to the legal responsibility a dentist assumes in performing surgical operations, the instruction in the methods of which is not generally embodied in the dental curriculum, and regarding which a doubt exists as to whether the possession of the dental degree will guarantee protection in case of legal prosecution for malpractice. There can be no doubt but that very serious results may arise from implantation of teeth, such as the transmission of syphilis, pyemia and tetanus. We very much doubt whether a jury of the present day would exonerate an operator practicing on his D. D. S. if such result should occur, especially if he could not demonstrate his entire fitness to perform such operation and treat all subsequent symptoms that might arise. It is generally accepted that thorough antiseptic precautions will reduce the danger of infection almost if not entirely, but he who would assume the responsibility ought surely to thoroughly inform himself upon these points, and be able to defend himself before a jury. Thus are the necessities for broader education being constantly brought to the notice of the profession. Dentistry cannot any longer be practiced as a trade, but he who would live up to all the grand possibilities of our grand profession must know the scientific as well as the mechanical part of dentistry. We make reference to these facts not to discourage any from practicing implantation, but to show the necessity for becoming thoroughly conversant with the scientific as well as the mechanical phase of the operation in order to be assured of all the protection possible in case of bad results which are apt to fall to any who perform surgical operations.

ANNOUNCEMENT.

After this issue the office of the *INDEPENDENT PRACTITIONER* will be removed from Buffalo to 1215 Filbert St., Philadelphia, to which address all editorial and business correspondence directly pertaining to the management of the journal may be sent. The office of the Secretary of the Association, Dr. Geo. S. Allen, is 51 West 37th St., N. Y. city, and any business correspondence relating to the Association may be sent to him. The journal is cosmopolitan in character. The Association is chartered in New Jersey, with the secretary's office in New York, while the editorial work is done in Philadelphia. It counts among its stockholders an equal number of Philadelphia and New York men, while shares are scattered largely in the New England, middle and western States and foreign countries. No change will be made in the dress or make-up of the journal until the beginning of Vol. X, January 1, 1888. The name will then be changed to *THE INTERNATIONAL DENTAL JOURNAL*. We hope by that time to have our list of foreign contributors completed, as Dr. W. D. Miller has very kindly undertaken to organize them. All our stockholders will naturally give their productions to us, and a glance at the list is all that is needed to guarantee the character of the future contributions of the journal. The number of writers in the dental profession are very limited, especially those who are doing original work, and we feel safe in saying that the *PRACTITIONER* will hold its own as a strictly independent scientific journal in the future as it has in the past.

The offer of Dr. Stowell's Atlas in connection with renewals or new subscriptions still holds. If you have one already and are satisfied with it, which you cannot otherwise than be, please tell some brother practitioner. Don't keep all your good things to yourself, but share them with your neighbors.

We will begin a full report of the union meeting of the Massachusetts and Connecticut Valley Societies, held at Boston, July 10, 11, 12 and 13, 1888, in the October number. Those who desire extra copies should send in their order soon.

SPECIAL ANNOUNCEMENT.

According to the terms of the transfer of the *INDEPENDENT PRACTITIONER* to the new syndicate, all subscriptions due the old syndicate for the current year are to be paid to the old syndicate.

If you are in arrears on your subscription which ran out July, 1888, or will close January, 1889, please send the amount of your indebtedness directly to Dr. Barrett, as we have nothing whatever to do with the business of the New York Dental Journal Association. All the bills and letters that you may have received have been sent by them and not by us. We are led to make this statement because parties have written to us enclosing money which did not belong to us. Of course, if we can do anything to accommodate our subscribers, we shall be glad to do so, but it will be better for you to send money due the New York Dental Journal Association directly to Dr. Barrett, as he has the books, and is conversant with the accounts, and, at best, we could only send the money on to him.

“EDITORIAL BOASTING.”

Under the caption of “Editorial Boasting,” the editor of *Items of Interest* unloads himself of considerable pent-up feeling. He criticises a straightforward business announcement of the International Dental Journal Association, evidently failing to recognize in it a living protest against the very class of journalism his represents. The production was in no sense a personal editorial, but voiced the sentiment of a syndicate composed of some of the very best men in the profession, and too strong to be lightly sneered at by the organ of a house that depends upon the profession for its support. We occupy an entirely different position from the trade journals; with us, independent journalism is first, and trade a secondary consideration, while with them the opposite is the case, or else we have entirely mistaken the business sagacity of the men who stand behind them. It would seem, however, that in this instance ordinary commercial foresight should have suggested a different policy upon the part of the *Items*.

It is no fault of ours that we find ourselves the editorial mouth-piece of the strongest syndicate ever organized in the dental profession, neither does the fact of its being International in character in any way detract from its strength. The present organization is simply the outgrowth of the advances made by the dental profession during the present decade, and to which the better class of trade journals have contributed their quota. No organ, in the time it has been before the profession, has done more than THE INDEPENDENT PRACTITIONER. Its columns have throughout

reflected a high class of literature, and its original communications have been more widely quoted than those of any other journal; although, I am sorry to say, not always been given due credit. An instance of this latter is found in the very number of the *Items* in which we are criticised. In this case a full page was taken bodily from the June number of *THE PRACTITIONER* without a line of credit being given in the text as to where it had previously appeared. In a journal made up almost exclusively of clippings, as is the *Items*, it must sometimes be rather confusing to give credit to all the matter without getting them mixed; and we could overlook small slips were it not for the lordly assumption of age and experience assumed by its editor, and the manner in which we are told to "hide our time and learn what it is to edit a dental journal." We confess that our experience in "tailoring" has been rather limited. We have always stood upon our own base, and do not intend to depart from first principles; now that we have dared assume the editorial chair. We do not intend that our journal shall cling like a barnacle to the skirts of other journals that have the energy to secure original matter for their columns, but shall always try to have something new and of interest to the profession. If two or three of the leading journals should decide to copyright their journals; our would-be critic would find his laborious task of using the clippings taken away, and be compelled to look elsewhere for his material.

In the article in question we made no mention of names, consequently it is rather amusing to see how readily the *Items of Interest* has put on the shoe of "trade journalism," and not only accepted the very modest definition we gave of their purpose and mission, but has added an additional clause, viz., "More advertising circulars for local houses." We are willing to let every one describe their own wares, knowing full well that if they will do so they can do it much better than any one else. On the whole, we really cannot see what there was in the simple announcement of an independent syndicate to call forth such an editorial, unless the shoe did really pinch. If that is the case, we would humbly, in view of our "inexperience" in dental, although not in other journalism, suggest to our honored and senior brother of the quill to enlarge the foundation upon which he stands, and take a position among the leading journals instead of depending upon the efforts and enterprise of others for his matter.

A DISAPPOINTMENT.

Dr. W. C. Barrett is in receipt of a cablegram from Dr. W. D. Miller, in which he states that he has been unavoidably detained at home, and shall have to forego the pleasure of his intended visit to America this fall. We were very much grieved to receive the intelligence, because we had intended to tender Dr. M. a warm reception upon the part of the International Dental Journal Association, which we take the liberty of saying feels honored in counting him one of its members and pledged contributors. There can be no question but that Dr. Miller's contributions in the past in the INDEPENDENT PRACTITIONER have served, more than anything else, to place the journal upon the high plane it now occupies. The series of articles that have just been completed under our management have been of a very high character and reflect credit upon Dr. Miller. They show how vast the field is, and how badly workers are needed to help solve the many yet unknown problems regarding oral diseases. Pyorrhœa Alveolaris still remains a *terra incognita*, having baffled, as yet, all attempts at the determination of its etiology. Still the work progresses, and step by step the sum of our knowledge is augmented. Nothing is impossible to the patient toiler, and we know no field of labor where patient, steady work is more needed than in that of Mycology—never has advance in any science been more laborious than that made in the germ theory of disease.

BIBLIOGRAPHICAL.

THE PHYSICIAN'S LEISURE LIBRARY, NUMBER 7. The Modern Treatment of Pleurisy and Pneumonia. By G. M. GARLAND, M. D.; Numbers 8 and 9. The Infectious Diseases. By KARL LIEBERMEISTER. Translated by E. P. HURD, M. D.

These are consecutive numbers of a series of medical works issued monthly by Geo. S. Davis, medical publisher, of Detroit, Mich. Subscription price \$2.50 per annum, 25 cents per number.

TRANSACTIONS OF THE NEW YORK ODONTOLOGICAL SOCIETY FOR 1887. Philadelphia: The S. S. White Dental Manuf'g Co.

This volume is uniform with the volumes of the transactions for some years past. It contains some valuable papers, and the cream of the discussions for the year, and forms another number of a valuable series. Of course it is handsomely printed and bound, for the S. S. White Dental M'fg Co. attended to that.

TRANSACTIONS OF THE DENTAL SOCIETY OF THE STATE OF NEW YORK FOR THE YEARS 1879, 1880 AND 1881.

These are the long lost records, which for so many years have been buried—somewhere. Even now, some of the most valuable papers are irretrievably gone. The matter was excellent in its day, but it has "an ancient and a fish-like smell" now, and there was no excuse for its publication, save the important one of completing the history of the society.

Current News and Opinion.

FOREIGN CORRESPONDENCE.

Editor Independent Practitioner:—

My attention has been called to a letter by Dr. Birdall, in your issue of May, 1888, in which he anathematizes my contribution on *Immediate Root Filling* to the last International Medical Congress.

My first objection to the letter of your correspondent is that in his second paragraph he employs quotation marks, even where the form of the sentence does not demand them, evidently with a view of emphasizing the fact that he is quoting my own words; whereas, as a matter of fact, he is only quoting your abstract of the words actually employed. I do not hesitate to say, if you will take the trouble to peruse my original paper, you yourself will admit that it would be difficult to conceive a more misleading and unjust abstract.

I did not preach any doctrines, but merely gave an account of a recorded experience of some five years of immediate root filling, supported by actual statistics, and contrasted these figures with others illustrating the results of treatment by the dressing method, which seemed to prove to me, as well as others, that far from being "as bad practice as can well be conceived," it is essentially good practice.

With regard to the rest of his letter, it would be only generous to decline, without further comment, his absurd, and I must say, amusing conclusions, since they are founded on altogether false premises.

I must, however, say something with regard to the editorial comment appended to that letter. My principal contention is, that you have failed to record my opinions that respectful treatment at the hands of the reporters to which you rightly admit I am entitled.

The following are the principal errors in the abstract. The statement, that I rarely see my patient again, is a perversion of the statement actually made as to the nature of a University practice. A student's academic career varies from three to five years, sometimes even longer, but it is, of course, evident that if, as sometimes happens, the patient only attends for dental treatment, near the termination of that career, he disappears in the natural course of events. My practice not being wholly confined to undergraduates, I have an

opportunity of seeing the results of my operations in the mouths of Fellows and Professors as well as residents in the town, as they return for the annual or semi-annual inspection. In fact, in the statistical part of my paper, I mention that I had seen 168 cases out of 272, a proportion which I believe would be even greater if the record were made up to the present time.

The practice of cleaning out the pulp-chamber but not the root-canals, and covering up the opening with a disc of paper "moistened with carbolic acid, on one side of which has been taken the twentieth to fifteenth of a grain of arsenic, this side being applied to the fang cavity" is Coleman's method, and not mine, and which I mentioned specially, because the clinical notes of his cases induced me to adopt immediate root-filling some years before it received any prominent attention in America.

In no part of my paper do I mention the combination of creosote with ten or fifteen grains of arsenic.

I never said that most of my cases are dismissed in less than half an hour.

I think, sir, you will admit that such errors as these are quite sufficient to vitiate an abstract scarcely a page in length, and that they constitute anything but respectful treatment.

I must also call your attention to the fact that a full report of my contribution appeared in the January number of the "*Dental Record*" with the illustrative tracings and detailed records of typical cases which unfortunately did not arrive in time for the meeting at Washington.

I am quite willing to stand by the opinions expressed in my contribution, and it seems to me that the only way in which you can do justice to them, after originating such wide-spread misunderstanding, as evidenced by the letter of your correspondent, is by publishing the paper in full.

GEO. CUNNINGHAM, B. A., D. M. D., L. D. S.

We gladly give room for Dr. Cunningham's letter, and would print his paper in full, also, if it had not already been published in the *Record*, and will also shortly appear in the proceedings of the Ninth International Medical Congress. We have, from the first, held opinions similar to those of Dr. C., and believe that we have gone to the extreme in the matter of instrumentation in root-filling —Ed.

DRY MOUTH.

At the meeting of the Clinical Society of London, March 17, 1888, Dr. W. B. Haddon read a paper on dry mouth, or suppression of the salivary and buccal secretions. The patient was a woman, sixty-five years old, who had suffered from no affection which could throw light on her present condition. There was no history of family paralysis, or of the prolonged use of belladonna. Her mouth began to get dry some months previous to observation. The tongue was red, devoid of epithelium, cracked in all directions, like crocodile skin, and absolutely dry. The mouth generally was dry, and the mucous membrane smooth, shiny and pale, with a few patches of injection. There was also a deficiency of moisture at the back of the pharynx. The tonsils were natural. The salivary glands, as far as could be made out, were natural in size. Common sensation

of the inside of the mouth was unimpaired, but the sense of taste was retarded in consequence of the deficiency of salivary secretion. When the mouth became moist later on, the saliva was found to be slightly acid, and to exert no action on a solution of starch. During this time the mouth had been getting dry, perspiration had notably diminished, and the lacrimal secretion was arrested. The patient received much benefit from the use of ichthyol: a case of similar nature under the care of Mr. Hutchinson was alluded to, and one under the care of Dr. Rowlands, of Liverpool, was communicated by the author of the paper. In conclusion, it was suggested that this condition of dry mouth was due to some disorder of the nervous apparatus.—*Lancet*, March, 27, 1896.

CANADOL AS A LOCAL ANESTHETIC.

Canadol is one of the constituents of a heavy naphtha ether (No. 11) obtained by the fractional distillation of American naphtha. It represents a liquid, very volatile, easily inflammable fluid, possessing a strongly pronounced benzine odor. The liquid is insoluble either in water or in alcohol. According to a report of Dr. J. P. Plushkoff, of Professor Hadensky's clinic, canadol was administered by means of Richardson's apparatus, the nozzle of the latter being kept at a distance of five or six centimetres from the operation field. The results were most satisfactory. The integuments became frozen in the interval, varying from thirty to ninety seconds, in a majority of the cases complete anaesthesia was obtained in less than a minute. Only one of the patients complained of pain when some deep lymphatic glands were incised. In the remaining cases the operation was quite painless as well as bloodless from the beginning to the end. The healing process did not differ from the normal in any of the cases.—*Theor. Gazette*.

OIL OF PEPPERMINT AS AN ANTISEPTIC.

W. L. Braddon has instituted extensive experiments to discover, if possible, an efficient microbicide which would be sufficiently harmless to human beings to answer for internal use. In a communication to the *Lancet* the author reports that these experiments were carried out, first under conditions as nearly as possible identical with those which obtain with wounds, etc., the relative powers of carbolic acid, iodine, iodoform, corrosive sublimate, and peppermint, being compared. The observer considers the complete superiority of the last completely proved, and has tried its powers in actual practice with most excellent results.—*N. Y. Med. Times*.

It has long been known in dental surgery that the essential oils are good antiseptics. Our object in quoting the above is to show that the medical profession is also awakening to a knowledge of the fact.

REIMPLANTATION OF A TREPHINE BITTEN OFF JUNE.

Herbert L. Burrell, M. D., Boston, Mass., reports a case of accidental trephining in a boy, æt. 13, in which the burr was placed in an unnecessary position during the examination. It was then replaced and the pericranial flap and scalp sutured over it, the wound completely healing in two weeks. The child

dying eight months later, an opportunity was offered for examining the skull. The trephine button was found united by bony union throughout. The author suggests that this opens an important field for exploratory action, since the cranial opening can be cured even more readily than an abdominal incision.—*Boston Med. and Surg. Jour.*, March 29, 1888.

THE following is taken from the *Hartford (Conn.) Times*:

“One Dollar.—All ordinary gold stoppings at the extremely low price (for first-class work) of one dollar. Our offer for sixty days ended on May 1st, but we have decided to continue it until further notice. All ordinary gold stoppings at the extremely low price of one dollar for first-class work. All other branches at proportionate prices. Dr. G. A. Mills, Oral Surgeon and Dentist, No. 18 Garden street, four doors from Asylum avenue, two blocks west of the N. Y., N. H. & H. R. R. Depot”

Advertisements in the public press are public property, and by quoting them it is presumable that we are only doing the advertiser a favor. The above party being a contributor to one of our esteemed contemporary journals, we have been requested by a dentist in practice to publish his full card, for which we make no extra charge. Comment is unnecessary.—[ED.]

THE officers elected for the ensuing year in the Pennsylvania State Society were:

President—H. C. Register.

First Vice-President—J. C. M. Hamilton.

Second Vice-President—W. H. Fundenberg.

Recording Secretary—J. R. C. Ward.

Assistant Secretary—C. V. Kratzer.

Corresponding Secretary—P. K. Filbert.

Treasurer—L. Ashley Faught.

Board of Censors—S. H. Guilford, G. L. Robb, J. S. Goshorn, W. H. True-man, and Alonzo Boice.

Board of Examiners—E. C. Kirk, W. E. Van Arsdell, and C. S. Beck.

The session adjourned to meet at Cresson Springs on the last Tuesday in July, 1889.

LAPLACE'S sublimate solution is more antiseptic and less irritating than ordinary solutions. For irrigation—sublimate 1, acid tartaric 5, dist. water 1000. Gauze and cotton for dressings are soaked for two hours in—sublimate 5, acid tartaric 20, dist. water 1000. We should prefer solutions of half the strength.

THE next regular meeting of the Illinois State Board of Dental Examiners will be held at 10 A. M., on Monday, Sept. 17th, in the State House, at Springfield. Candidates for examination must report at that time.

CHARLES E. KOCH, Sec. Ill. State Board.

IODOFORM, while not a germicide as such, becomes so by evolving free iodine. Laboratory evidence is not sufficient to make us abandon an agent which, used with discretion, is of immense value, especially in the surgery of the cavities.

THE Independent Practitioner.

VOL. IX.

OCTOBER, 1888.

No. 10.

NOTE.—No paper published or to be published in another journal, will be accepted for this department. All papers must be in the hands of the Editor before the first day of the month preceding that in which they are expected to appear. Extra copies will be furnished to such consideration of any approved original essays, and reprints, in pamphlet form, may be had at the cost of the paper, press work and binding, if ordered when the manuscript is forwarded. The Editor and Publishers are not responsible for the opinions expressed by contributors. The journal is issued promptly, on the first day of each month.

Original Communications.

THE GERM THEORY OF DENTAL CARIES

BY GEO. S. ALLAN, NEW YORK CITY.

Read before the Connecticut Valley and Massachusetts Societies at their Union Meeting, held in Boston, July 19th, 1888.

Dental art has existed for many a long day, but dental science is of far more modern origin. The profession welcomes the latter, and rejoices in its growth and development; for it marks a new era and a higher standing for all that pertains to our specialty. Science is most exacting in its demands and methods of research, and calls into its service the most highly trained scholar; and as everything it touches or is interested in is elevated and enriched.

Few professions or callings have advanced more rapidly in the last decade than dentistry; and this is mostly due to the good work science has done for it.

The subject I have to present to you this evening belongs purely to the domain of dental science; and is the latest and most

valuable contribution to our literature. Dealing as it does with first causes, it commands our attention, and attracts by the promise it makes of new and more efficient methods of practice.

The etiology of dental caries has, from the beginning, attracted far more than an average amount of attention and thought.

Few results, however, of any value, up to a late date, have rewarded the efforts of those who have attempted the solution of the problem. Theories and beliefs were plenty, but, because of their slight foundation, they commanded little respect. Cleanliness and the filling of cavities already formed with some indestructible material, were known to be valuable means in arresting decay; but why, or wherefore, could not be stated with any certainty. It was strongly suspected that an acid or acids in some way gained access to the oral cavity, and was the active agent or agents in destroying the teeth; but how it got there, or what conditions of health or disease promoted its formation, could only be guessed at, and by many these difficulties were considered so great as to lead them to reject the idea entirely. "Why," they said, "lay the decay of teeth to an acid, when you can neither account for its presence in the mouth, or for its peculiar mode of action in forming well-marked cavities in the teeth instead of, as would naturally be suspected, uniformly acting on the surface of the teeth." Hence the vital and the chemico-vital theory, and a host of others, each having its advocates and followers in proportion as it seemed plausible, or accounted for the conditions presented. No one theory had any great following, for the simple reason that none was free from serious objections. There were too many broken links in the chain of evidence connecting cause and effect. The mixed chemico-vital theory was probably the most strongly entrenched of any; still there were many blots on its character, and few spoke of it with more than doubtful respect. To Dr. W. D. Miller, of Germany, an American I am proud to say, belongs the honor of having solved the problem, and of giving us not only a theory of dental caries, but of demonstrating his theory by so thorough, painstaking and careful a series of experiments as to leave no doubt in the minds of fair men that it is not only the true theory, but the only one resting on a scientific basis. Great credit, therefore, belongs to Dr. Miller for his valuable work. He has

placed the profession under many obligations—obligations which I firmly believe they will be only too glad to repay in honor and fame. I do not appear before you tonight in defense of the theory, or because it is not well-grounded, and needing support or vindication; but because it is comparatively new and may not be familiar to all; and, further, because, through the kindness of Dr. Miller, I have had more than the average opportunity of studying it. My hope and desire is to so present it that you may take hold of it in its simplicity and completeness, and see how fully all doubts and objections have been met, and how carefully and thoroughly Dr. Miller has finished the self-imposed task.

In commencing, I hope you will pardon me for giving a short, general description of bacteria; what they are, how they grow and do their work. I will go into detail only sufficient to make my picture fairly complete, and enable those who may be rusty in their reading to follow the chain of evidence and reasoning that led Dr. Miller to his conclusions. In other words, I will try to anticipate such questions as would naturally suggest themselves to the minds of those not well posted if I were showing them the actual specimens under the microscope. A method of instruction which I am most sorry I cannot carry out at the present time, for it would be by far the most satisfactory to pursue. Fortunately, the salient facts in regard to the theory are not many, and are easily grasped; and with the help of the lectures and photographs that I have had prepared, and which are the best substitute, and a fairly good one, for the microscope and slides, I hope to attain a moderate success.

Let me premise that I have nothing specially original to offer you. My observations upon the subject have been mainly based upon some thirty odd preparations kindly sent me by Dr. Miller, and such general work with the microscope on the fluids of the mouth, and the contents of the cavities found in carious teeth, as would naturally follow in seeking such information. It has been a study beset with many difficulties, but compensating many pleasures and no little satisfaction.

He who takes up the study of bacteria enters a veritable wonderland, and the deeper into it he dips, the greater will be his surprise, amazement and delight. He will be amazed to learn how important a role they play in life, and that his very continuance in

life depends upon their presence in, or absence from, his system; and he will be delighted with the new world of knowledge presented to him. A new science has been created, that of Mycology, which to-day is exciting more general interest, and engaging more thought and study than most of the older sciences. A new literature of surprising extent and variety is being created, and so eager and numerous are those who occupy their time with it, and so steady is the stream of their discoveries, that we seem to be but on the threshold of what we are to know in the near future.

What then are bacteria? What forms and shapes do they present? How do they grow, increase and multiply? First, then: Bacteria are the smallest of known organisms, and, though near the border line separating animal and vegetable life, are now placed among the plants. For a time their true classification was in doubt; but as the study of their life processes proceeded, it was seen that most of their analogies were with the vegetables. To this view almost all the authorities of note agree. De Barry, *vide Lectures on Bacteria*, pp. 37: "We can only say, therefore, that the bacteria, together with the rest of the schysophytes, are a group of simple plants of a low order." Bacteria, in brief, are unicellular plants; plants composed of one cell, and that of the simplest character and most minute size. They are formed, mainly, if not entirely, of protoplasm; a cell envelope or wall of more or less consistency is commonly present, but cannot be said to be a universal characteristic. So far as known they are structureless; that is to say that, owing to their extreme minuteness, even by the use of the very highest powers we have failed to differentiate the elements of which they are composed. In size, bacteria differ among themselves greatly; but they are small compared with other vegetable cells. Expressed in fractions of an English inch, they vary from $\frac{1}{100000}$ or less, for many are too small to be measured, to $\frac{1}{125}$ of an inch. In shape and form they vary somewhat, but not as much as might be expected; the simple spherule, or dot you may say, being the most common, and the same elongated in one direction so as to form a rod, coming next. The first are commonly called cocci, the second bacilli, and the same twisted on themselves spirilli. Little, however, can be made of individual shapes, and they cannot, as a rule, in that way be separated into species. The highest powers of the microscope fail to accomplish this. That there are numer-

ous species, and genera even, does not admit of question; but a study of their life history, and their physiological, as well as their morphological, characteristics is necessary to determine them. Bacteria that cannot be distinguished one from the other, in the isolated state, present in cultures striking differences, not only in their groupings, but in the changes they effect in the media or substratum they grow upon.

In the manner of development and propagation, bacteria have many characteristics in common with the higher forms of plant life. The individual cell first elongates in one direction, until it is nearly or quite double that of the original cell. Then, after a short period of rest, a slight constriction may be observed in the centre, not of the cell as a whole, but of its contents. This continues until the cell is divided. Sometimes these cells thus formed fall apart, and again they remain united; but in either case they have nothing in common. This process goes on continually. A cell that does not grow soon loses its vitality, and the presumption is that the great mass of bacteria perish in this way. The formation of spores, the second method provided for the continuation of the species, generally commences when the process of multiplication by division ceases. The contents of the cell, instead of dividing, contracts on itself, forming a so-called spore, which afterwards, by the breaking up of the cell wall, is liberated. Commonly but one spore or seed is formed, but at times from four to six may be developed. These spores thus formed present some striking characteristics, the most noticeable of which consists in their pronounced vitality. They resist greater extremes of temperature, stronger acids and alkalies than the parent cells, and in every way are more difficult to destroy.

One of the most interesting features of bacterial life is found in their waste products, and the influences they exert on the media in which they grow. It is not common to think of waste products in connection with plant life; but they are no more a feature of animal life than they are of plant life. The feces, the urine, the carbon-dioxide from the lungs are the effete matters of animal life, and have their analogies in plant life. In proportion to their size, animals absorb a larger proportion of food products than vegetables, and cast off more, and in a more soluble form. But here the difference ceases.

Plants store up large amounts of waste products in their tissues, notably in the woody fibres, the outer layers of the bark, and in the leaves that drop off in the fall, etc. Starch is stored up in the potato. Then again the alkaloids, such as quinine, strychnine, and the gummy exudations, and resins are also waste products. The roots of plants throw off much waste material, but these are mostly absorbed by the soil in which they grow.

One classification made in bacteria relates solely to their habitat, whether it is in a living or a dead organism—the former taking the name of parasites, the latter saprophytes. Pathologists have their hands full in dealing with the former; our business is with the saprophytes only. To this class belong the fermentative, the putrefactive, and the pigment forms and varieties. Zymogenic or ferment-producing bacteria flourish in non-nitrogenized media. The putrefactive bacteria acts on proteids and nitrogenized material generally, and in many ways their action is more complex than is that of the ferments, though analogous to it. The compounds resulting from their growth are oftentimes most offensive and even dangerous to life when taken into the system. The so-called ptomaines belong to this group, and are active poisons, and that in proportion to the dose. They are septic poisons, not septic infections. Whether they belong to the waste products of bacterial life, or are formed by the action of some waste products on the organic menstruum in which they are produced, cannot be stated with certainty.

A most interesting point connected with bacterial life is the conditions which favor their existence, as well as those that antagonise it. But little is known concerning them. The field of investigation here is large and promises most valuable results; for it is in this direction that we must look for means to prevent their ravages. It is easy enough in the laboratory to try the effects of various degrees of temperature, acids, alkalies, etc.; but these experiments tell but little that is useful when applied to the human system, for there they do not repeat themselves. There are other agencies far more subtle in their mode of actions that have not been discovered, that are far more potent in power and mode of action. They are the ones that are constantly promoting and retarding bacterial life. Fortunately, the science being comparatively new, and the number of workers many, it is reasonable to

suppose that the near future will bring a solution of the vexed question. It will be a grand gain for suffering humanity when it is reached.

We dentists are more especially interested in the physiological aspect of the question; and, although we unquestionably know the prime cause of dental caries, we are as yet groping in the dark for means of prevention. Those that we have are crude and cumbersome and do not always hit the mark.

The study of bacteria requires special apparatus to meet definite wants and the liabilities for error are many. There is, probably, no branch of study which calls for greater care, patience and persevering effort, and no one who takes it up need expect good results who has not all these requisites at his command.

One of the first and greatest difficulties which met the early workers in this field was in obtaining "pure cultures," that is, to say, a growth of one species only, and to maintain them through successive generations, so that the life history of each individual, and all related to it, could be determined. In this way only can results of value and precision be obtained. At first sight it would seem to be an impossible task to pick out individual bacteria and plant them in a medium free from all other bacteria, or the germs of same, and maintain these conditions for any length of time. Many and various were the plans proposed and tried before the desired end was attained. Prof. Koch, of Berlin, however, finally opened the door and in a way most simple and easy. He so prepared gelatine that would liquefy at about a temperature of 55° cent. Into this he placed other food materials suitable for the growth of bacteria, and the whole was then sterilized by heat. The gelatine thus prepared was spread in thin layers on glass slips, and the germs, or material suspected to contain germs, was scattered over it. Afterwards it was allowed to consolidate by lowering the temperature; generally, the bacterial material was scattered over the gelatine by means of a needle point which was first dipped into the material to be examined, and then drawn across and through the gelatin. In this way, it can be easily seen that some germs would be isolated and held in the stiffened mass where they would grow and develop. Afterwards the separate colonies could be transferred to other vessels and more complete study be made. So much for bacteria in general. Now for our special application.

Koch says, that to determine whether any particular micro-organism is the prime cause of any special disease: 1st. "The micro-organism must be found in the blood, lymph or diseased tissues of man or animal suffering from or dead of the disease." 2d. "The micro-organism thus obtained must be isolated and cultivated in suitable media, that is, outside the animal body. These pure cultivations must be carried on through successive generations of the organism." 3d. "A pure cultivation thus obtained must, when introduced into the body of the healthy animal, produce the disease in question." 4th and lastly. "In the incculated animal the same micro-organism must again be found." Koch, in laying down these laws, had in mind parasitic bacteria only—those that live upon or in the living body and produce certain well known and marked diseases, such as typhoid or scarlet fever, etc. But I quote and will employ them, though the bacteria of dental caries are saprophytes and live on dead organized matter only. I do this for the reason that Dr. Miller asks no favors in demanding your acceptance of his theory. He makes it conform to the same rigid, unyielding laws. Before Dr. Miller commenced his work it was well known that the tubules of carious teeth were much enlarged, broken down, and filled with micro-organisms; but it was not known whether these fungi were the cause or a sequence of the disease. Leber and Rottenstein had long before published the result of their researches, proving the existence of such organisms in carious teeth, and awarding to them a prominent part in the work of tooth destruction. But they surmised far more than they demonstrated, and stopped short, even in their guess work, of the full meaning of the fungi they had found. It was also well known that the oval cavity was a garden rich and rare in the numbers and variety of bacteria growing and flourishing in every part of it, especially in and around the teeth; and, furthermore, that fermentations were continually going on within its wall, and that these fermentations were accompanied, more or less constantly, by the formation of acids.

Just here Dr. Miller starts in with his work. It would neither be possible or advisable in a paper of this character to attempt to follow all of Dr. Miller's experiments and explanations; only enough will be mentioned to give you the groundwork of his theory. Any one who follows his line of argument, and the evidence, as given in

detail in his papers published in the *ISHERINGTON PRACTITIONER*, Vol. V, Nos. 2, 3, 5, 6, and 7, will see that so far as great care and thorough preparation are concerned, nothing was left undone that could be done to avoid errors or misstatements of facts or conclusions; no one was better aware of the almost endless number of agents which combine to vitiate such experiments and the extraordinary great care which was necessary in excluding and eliminating all irrelevant factors. As just stated, it was known that fermentation of various kinds and degrees were constantly going on in the mouth; but the nature of the ferment, whether it was an organized or an unorganized one, or both combined, and their relative values had yet to be settled. The initial experiments of Dr. Miller were instituted to determine these points. Ptyalin, an unorganized ferment, is, of course, constantly present in the fluids of the mouth, and its ferment powers were well known, but Ptyalin is destroyed by a heat of 67° cent., while bacteria are but little affected by the same temperature. On the other hand, a half per cent. solution of carbonic acid or a strong solution of ether rendered bacterial life inert. A short series of experiments, based on these two facts, soon proved that the acid forming ferment in the mouth was one capable of reproducing itself, and was, therefore, an organized ferment. The fact that fungi were present in carious tooth substance, as before stated, was already known. The microscope had revealed their presence to many observers; but that it was an acid producing fungi was not known. In these experiments, material was taken not only from the oral fluids, but from the deeper portions of carious teeth, with corresponding results. The same fungus with like reactions was present in both cases. Again, certain fungi not only do not require free access to the oxygen of the air for their life powers, but thrive better when removed from it, and a classification into a aerobic and anaerobic bacteria has been based on this fact.

A second series of experiments proved that the fungi under investigation belongs to the anaerobic division, and thrived when removed from the air, a point of the greatest interest, showing as it did, that deep down in the bottom of the tooth, away from the air, this fungus could grow, develop and perform its destructive work. These two series of experiments throw much light on the etiology of the decay of teeth, and ascertain, as nothing else has

accounted, for the peculiar manner in which teeth are destroyed. Whenever, either between the teeth, in sulci or pockets, through faulty development a lodgement can be had for food products, a miniature acid manufactory is set up. The acid freed in this manner decomposes at once that portion of the tooth with which it comes in contact, uniting with its lime-salts and forming new combinations, and as decalcification advances, bacteria follow after, throwing out in their growth new waste products in the form of lactic acid. Chemists tell us that nascent acids, those just formed, are most powerful in their actions in seeking new affinities; and here the acid is continually being eliminated, and in its fresh condition brought in contact with the lime-salts of the teeth. The sugar which is ever present in the mouth, in some form or other, is the natural ferment food on which these bacteria thrive, and if by any chance it is not present, the ptyaline of the saliva soon produces it by its action on the starchy elements of our daily food. These two series of experiments would seem to establish the germ theory on a strong basis. We can safely say they make the truth of the theory most probable and plausible; but others follow which are even more convincing and practically close the argument. They are in keeping with the first of the laws laid down by Koch, in considering pathogenic bacteria, exceeding, however, its requirements. The third in the series of experiments was (*a*) to procure a pure culture of the bacteria found in dental caries. This was obtained in the manner briefly described in a previous page of this paper. The mother material used being the deepest portion of the decayed tooth carefully removed from its bed with a sterilized knife point. (*b*) A little of this pure culture thus obtained was placed in two tubes, the one containing a fermentable mixture, beef extract, to which two per cent. of cane sugar had been added, and the other a non-fermentable fluid, beef extract without sugar. Both tubes and their contents having been previously completely sterilized. Into each tube was placed small pieces of a freshly drawn, healthy bicuspid tooth, also completely sterilized. The solution in the first tube became acid in a few hours; that in the second, not being fermentable, remained neutral. The sections of sound tooth in the first tube soon softened and at the end of a week were pliable and could be bent like pieces of soft cartilage. At the end of the second week all but the thicker sections were

completely decalcified, and could be easily cut with a knife. Thin sections of these softened pieces of tooth were then made by means of a freezing microtome. The sections were then stained and mounted in the usual manner, and submitted to microscopic examination. All the well-known signs of dental caries were found to be present; namely, the distended tubules, broken down and distorted by the micro-organisms. Artificially produced caries thus became an accomplished fact. If you ask what became of the pieces of dentine placed in the non-fermentable mixture, the answer is, they suffer no change. No acid being formed, their integrity was not affected. Bear in mind, please, that in the first tube, the one in which the sound pieces of tooth were placed, and afterwards found to be destroyed or in process of destruction, depending on the length of time they were left in the mixture, contained no trace of acid when it was sealed up, and none could gain access to it except such as was formed as a sequence to the fermentation set up by the bacteria. These last experiments would seem to be conclusive to any fair mind, and fully meet the requirements called for by Koch in his last three laws.

A study of the beautifully prepared slides of Dr. Miller are most satisfactory and instructive, and I doubt whether the most expert microscopist could by such an examination alone say whether he was looking at a piece of natural or artificially induced caries, so closely do they simulate each other in all physical characteristics.

Three separate ferments are produced by the fruct of dental caries. The first, an inverting ferment; one capable of changing a non-fermentable sugar, like cane sugar, into a fermentable one, and possibly of forming sugar from starch. The second, an acid producing ferment, the product of which has been proven to be lactic acid. The third, a peptonizing or digestive ferment. All play important parts in the work of tooth destruction. The first prepares the food for the second. The second dissolves out the lime salts of the tooth, and leaves it an easy prey for the third, which, in turn, eats up, dissolves, the animal basis left after the mineral matter has been removed, and reduces the whole to a pulpy or soft condition.

It would seem unnecessary, before such an audience as this, to take even a moment in pointing out the lesson all this teaches. If cleanliness is next to Godliness anywhere, it is in the mouth. Every

means should be used to keep it in a state of purity. The use of the tooth-pick, floss-silk and tooth-brush must be constant and thorough. Antiseptics and germicides in some form are also strongly indicated. But just here we find ourselves in a sea of doubt and uncertainty. Germicides and antiseptics we have in plenty, but what ones can be used with safety in the mouth, or which ones possess the most valuable properties remains to be settled. Listerine so far seems to meet the demands most satisfactorily. But it may be set down as a certainty, that no antiseptics will ever make the use of the brush, pick and silk unnecessary. The great want is to find some means to make tooth structure impervious to bacterial invasion, which can only be done by so changing its character that bacteria will not grow in or upon it. So soon as we can, by some application or other methods of treatment, render danger points in teeth such as fissures, sulci and the margins of fillings an unfit soil for their growth, the task will be accomplished.

In office practice bacterial studies, in general, mean a great deal for the safety and comfort of our patients, and the dentist's satisfaction in obtaining good results. In the treatment of dead teeth it insures an amount of success never before thought of. I seldom now use a broach or nerve instrument without first dipping it in a solution of bi-chloride of mercury, of a strength of about one-fifth or one-half of one per cent. In old dead teeth from which the pulps have not been removed, and which heretofore have been so much trouble to treat, by the intelligent use of antiseptics and germicides, treatment becomes easy and comfortable to both patient and operator. The old story we have all listened to so often, "Doctor, that tooth never gave me a particle of trouble till you touched it," ceases now to be a dread.

Knowing whence our trouble comes, and its remedy, we can prevent it. Dr. J. Morgan Howe, of New York, in a most able paper read before the New York State Dental Society at their annual meeting in 1887, pointed out the cause and prevention of this whole class of difficulties. In that paper he suggested the fact that the devitalized pulp was a most favorable basis for bacteria to grow and develop in, and that the long chapter of periodontal troubles, that we are so familiar with, had their origin in the entrance of these fungi into the pulp-chamber, and their development in the dead pulp. His remedy consists in making an appli-

cation of iodoform to the dead pulp, so soon as it is discovered, and in this way, by making it an unfit soil for the growth of the germs the evil is warded off. I have for sometime shaped my practice in a similar way, using, however, iodol and mercury bi-chloride instead of iodoform. Dr. Howe, I speak from memory, advises leaving the iodoform in the pulp-cavity two or three days, changing daily.

In cleansing teeth, removing tartar, etc., especially in the treatment of pyorrhea alveolaris, I dip my instrument constantly in the same bi-chloride mixture. By this means, I am certain to carry it well under the margin of the gums, and into the recesses of the tartar pockets. The results have been most satisfactory.

Every now and then some one, no matter how careful he may be, will expose a pulp. Nowhere do I believe that antiseptic surgery is more valuable and certain in its beneficial effects. In all such cases, I immediately cover the point of exposure with a bit of cotton saturated with mercury bi-chloride solution, or a little powdered iodol. I wish I could tell you which was the better treatment. I am certain that we need fear little trouble from an exposed healthy pulp, if we adopt antiseptic treatment in time.

In all flesh wounds, in the mouth, the same treatment is indicated. No tooth should be extracted, especially in a bad mouth, without following it with an antiseptic application. The same may be said of lancing the gums, opening abscesses, etc.

How far a foul mouth may affect the general health, independent of its action on the teeth, is only commencing to attract attention. Dr. Miller has taken up the study, and strongly has pointed out many dangers, showing as he does how pathogenic bacteria may in this way gain access to the stomach, lungs, and through abrasions, enter the circulatory system.

In closing, I have a pleasant duty to perform in acknowledging my indebtedness to my good friend, Dr. Andrews. From the first, he has taken the deepest interest in the matter, and generously offered to make such photo-lithographic studies as I should need for illustrations. How well he has succeeded, you will soon be able to judge for yourselves; but you cannot know, as I know, the time and patience he has devoted to the task. Had I been aware of what he was undertaking, I never should have allowed him to have undertaken it. When I found out what his self-imposed task

meant, I did my best to have some pictures made by other experts, but they all failed. I want also to thank Dr. Sudduth for his assistance and encouragement.

THE USE OF COPPER AMALGAM.

BY SIDNEY S. STOWELL, D.D.S., OF PITTSFIELD, MASS.

READ BEFORE THE UNION MEETING OF THE CONNECTICUT VALLEY AND MASSACHUSETTS DENTAL SOCIETIES, BOSTON, MASS., JULY 10, 1888.

The subject named has been so thoroughly canvassed that I will not undertake to give its origin or history. It is my purpose at this time to try and bring before the profession some important points with regard to the manipulation of this most valuable tooth saving material, which has been called by no less a man than Fletcher, an absolutely permanent filling for cavities in the teeth; this I claim cannot so truly be said of any other material used for that purpose; it is without doubt the oldest plastic filling material known, it having been used by the English for more than sixty years. One make, known as Sullivans, having been made after the same formula for that length of time.

The saving qualities of copper amalgam need no argument to prove them second to no filling material known to the profession. It has stood the test of sixty years, and is still in its place. That it turns black is known to all. This is its only fault, and how small is it as compared with the great advantages which it possesses as a preserver of teeth. It *will not shrink*, a quality which in my judgment is not possessed to so great an extent by any other amalgam known. The chemical action which it exerts upon the tooth structure with which it comes in contact is, as a germicide, such that, when reasonable care has been used in its insertion, caries of the tooth at that point *cannot recur*. Think for one moment, gentlemen, of the force of this assertion, which, if it be true, the same cannot be said of any other filling material. I have studied well the manufacture and use of copper amalgam, as a filling material, for several years and with the most satisfactory results. I have also used many of the common high and low grade amalgams, manipulating them to the best of my ability, the rubber dam being used, and all care and skill exercised upon teeth of seemingly fair

quality, but which in a year's time have decayed rapidly around my high grade amalgam filling.

My gold fillings in the incisors of the same mouth have stood well, but the cavities have become large in the proximal surface of the molars and in the wisdom teeth which were soft.

I have used copper amalgam in the same teeth without a single failure, although where high grade amalgam was used in one side of several of the teeth it failed as before. A record having been kept of these cases, and subsequent examinations made, have proved that copper amalgam has saved the teeth, where high grade amalgam has failed.

Teeth filled with copper amalgam do not discolor any more than where other amalgams are used, because there is no shrinkage, consequently no leaking, and, therefore, no discoloration.

The surface of the filling is somewhat darker than that of other amalgams; but the teeth are saved, and to all appearances for the life time of the patient. Had not you rather see in the mouth of your patient a filling, the surface of which is dark, and the teeth saved in a healthy condition, than a white filling, with a recede of caries? In your own mouth which would you rather have? We fill teeth to save them; that is what our patients want; that is what they pay for.

Let us now consider the manipulation of copper amalgam which, as is generally known, is supplied to the profession by the trade, most of it being of English make. I have manufactured copper amalgam for some time, and do not consider that the English amalgam possess any superiority over some American makes.

As we receive the amalgam from the trade, it is put up in the form of bars or pellets, which are very hard; amalgamation having taken place, an excess of mercury being used, and the mass allowed to harden. A portion is placed in an iron spoon, and heated over an alcohol lamp or Bunsen burner until the mercury begins to ooze out. Now heat gently until it can be crushed by slight pressure; do not heat beyond that point. Transfer to a small glass mortar with pestle, and press out the excess of mercury through chamois skin with pliers. My copper amalgam if, when treated in this way, will become quite hard in from fifteen to thirty minutes, and fully hard in one hour's time. If, however, it is heated beyond the point mentioned, it will be slow setting.

Thus a quick or slow setting amalgam may be obtained from the same beginning through difference in manipulation. By care and experience, the operator can soon acquire the ability to produce a quick or slow setting amalgam at will.

A quick setting amalgam may also be obtained by using as soon as the copper is combined with the mercury for the first time, or the mass has been allowed to harden; but on account of the great inconvenience of making from the beginning a new lot of amalgam for each operation, the softening by heat of that already prepared is preferable.

Copper amalgam fillings may be topped off with any high grade or so-called "white alloy," or with gold, thereby rendering the operation more sightly without interfering with the saving qualities of the copper.

Amalgams in all their forms have been classed together and called "the lazy man's fillings."

I am not an amalgamist, nor a lazy man. I am a contour-with-gold-compound-proximal-bicuspid-and-molar man; although I am happy to know of so valuable an adjunct to our usual methods of practice, whereby we may save a large class of teeth which, in my judgment, could not so permanently be done by any other means.

THE TREATMENT OF PULPLESS TEETH.

BY GEO. F. CHENEY, ST. JOHNSBURG, VT.

READ BEFORE THE CONNECTICUT VALLEY AND MASSACHUSETTS SOCIETIES AT
THEIR UNION MEETING, BOSTON, JULY 10, 1888.

Since the reading of Dr. Stockwell's paper before the Vermont State Dental Society in March, 1886, published in the May number of the Archives of Dentistry, upon "The Treatment and Filling of Root Canals at a Single Sitting," I have given the subject considerable thought and study.

The treatment I have followed is not in strict accordance with Dr. Stockwell, but is taken from the ideas advanced by him and several other writers.

The treatment of pulpless teeth is and has been for some time past receiving a good deal of attention at all society meetings, and to my mind is a subject that cannot be too fully discussed, and is

one we should be constantly studying, it being one of the most important we have to deal with. While I do not advocate the treatment and filling of all classes of these teeth at a single sitting, I do claim that a majority of the teeth with freshly devitalized pulps, and those in which the pulps have recently become necrotic, had better be filled at the first sitting than to prolong the treatment. But with teeth where there has been much periodontal trouble, or where the pulps have long been septic, it is inefficient, and I think an unsafe practice to introduce a disinfectant, immediately following it with a germicide, and that by a permanent root filling.

Frequently we find the tissues, not only of the tooth itself, but of the territory beyond infected, and impossible to be made entirely aseptic at a single sitting. Again, we frequently find teeth where there is an effusion of moisture of one character or another which is impossible to check at once; with teeth of this class the treatment should be prolonged, but very rarely beyond the second sitting.

Pulpless teeth, although sometimes called such, are not necessarily dead teeth. The destruction of the pulp simply deprives the dentine of its chief or perhaps only supply of nourishment. It does not at all effect the connection of the tooth with the jaw or the nourishment of the cementum. The connection of the tooth with the jaw is sustained by the periodontal membrane, that being abundantly supplied with blood by arteries coming to it at the apical space, and through the alveolar walls. While we may have an abscess in the apical space that destroys the blood supply from that source, the membrane is still well supplied through the alveolar wall.

Therefore, by properly protecting the dentine, and by careful treatment a tooth that has been deprived of its pulp, it can be put in condition to be maintained for years or perhaps a lifetime.

We have been taught that micro-organisms are an important factor in, if not the cause of the formation of pus, that the saliva is one of the best culture mediums known for these organisms, and that they are nearly always present in it. It therefore follows that we should use extra care to exclude the saliva from a tooth while under treatment. Under all circumstances, when opening into a pulp canal, whether to extirpate the pulp or to change a dressing, adjust the rubber dam and disinfect the tooth involved, and all instruments used. It is the only way to insure thorough-

ness, and thoroughness is pretty sure to give success in all cases.

The treatment of teeth with newly devitalized pulps is very simple. Remove all decay and septic matter from the cavity, wash the tooth cavity and rubber dam thoroughly with one one-thousandth solution of bi-chloride of mercury, open the pulp-chamber in a way that will give free access to the root canals, and with a freshly disinfected broach remove the pulp, being careful to leave no part of it; wash canal with the bi-chloride of mercury solution, and dry thoroughly, using cones made of bibulous paper, and hot air. Now the canal is ready to fill, and if the work has been carefully done abscess cannot occur.

For filling root canals, anything that will hermetically seal the apex is allowable, although gutta-percha is in most general use, and I think it the best material on account of the ease with which it can be introduced. Under no consideration fall into the fatal error of using cotton; it will not seal the apex, and disaster will sooner or later follow. I fill these teeth by first pumping a little gutta-percha and chloroform of about the consistency of cream to the apex, following with a cone, working it well into the canal, until the patient gives a little jerk, which proves the apex has been reached.

When the canals are very small; for instance, mesial roots of lower and buccal roots of superior molars, after the gutta-percha has been worked in as much as possible, introduce a piece of fine gold wire, being careful not to crowd it through the apex, it will force the gutta-percha more solidly into the root.

Teeth with putrescent pulps are frequently found where the pulp has died from exposure or some other cause. Such cases very often occur under oxyphosphate fillings. The treatment is very simple. Remove all decay and septic matter from the cavity and canal, using care not to force anything through the apex; then, with a syringe and hydrogen peroxide, cleanse the canal thoroughly. This cleansing should be continued until all bubbling ceases, after which wipe the canal dry and introduce into it the bi-chloride of mercury solution, allowing it to remain a few minutes; dry thoroughly with hot air, and the root is ready to fill.

When the pulp has been dead and putrescent for a long time, or where there has been apical trouble or blind abscess, the treat-

ment is more complicated. These cases I never fill at the first sitting, but disinfect as thoroughly as possible, and fill the root with cotton saturated with iodoform and eucalyptol, sealing the cavity with gutta-percha, dismissing the patient for about a week, with instructions to return at the first indication of trouble. If at the end of this time I find no signs of pus, I fill; if pus is found, repeat the treatment, dismissing the patient for another week. It very seldom becomes necessary to prolong the treatment beyond this. If, after the tooth is filled permanently, there should be any serious trouble, resort to depletion, cutting deep down at the apex and toward, but not to the margin of the gum. This relieves the tension, and has always met the requirements of the case, so far as my experience has been.

I have had one or two cases of blind abscess where, after repeating the treatment several times, I still found a slight watery discharge, tinged with blood. This I arrested with alcohol and hot air, then filled, having no after trouble.

Cases of acute alveolar abscess as a rule require very little treatment. Open into the pulp canal, disinfect as much as possible with hydrogen peroxide, leaving the canal open for a day; then continue treatment. When opening into the canal, if the tooth is very sore, the operation can be made less painful by tying a string about the tooth, allowing the patient to pull down on it.

If the tooth should be too sore to admit the opening of the pulp chamber, make an opening from the outside with a burr. This operation can be made comparatively painless by drying the gum and marking it with carbolic acid crystals. This opening will give the pus a chance to escape. When after a day the inflammation will have subsided sufficiently for the opening of the pulp chamber and the continuance of the treatment, which is about the same as given for teeth with perforated pulps, filling temporarily for a week. Usually the two sittings are all that is required.

For chronic alveolar abscess the treatment is nearly the same as heretofore given. After opening and cleansing the pulp chambers and canal as before, introduce the hydrogen peroxide, allowing it to pass through the apex and fistula; then pour the one one-thousandth solution of bichloride of mercury into the canal, allowing it also to pass through the apex and fistula. I sometimes use a stronger solution of the bichloride of mercury—say one grain

to the half-ounce—for the roots; but not to force through the apex.

I fill these teeth temporarily until the fistula commences to heal. The fistula will, in most cases, close up in a few days without further treatment; although we sometimes find necrosed bone, which should be removed with a sharp burr, after enlarging the fistulous opening. Sometimes, when I have found fistulæ that were obstinate about healing, tincture of iodine introduced along the track has produced the desired effect and brought about healthy granulations.

Fistulous openings at the margin of the gum I have found the most difficult to heal. I think it is in these cases we are most likely to find necrosed bone.

If, at the time I remove the temporary filling from any tooth under treatment, signs of pus are found, I repeat the treatment, dismissing the patient for another week.

Dr. J. A. Dunn, of Chicago, has invented a syringe that I have found very useful for treating teeth, and especially convenient for introducing medicaments through the fistula to the apex of a tooth.

In writing this paper I have attempted nothing scientific; but to give a plan of treatment that, if carried out with care and thoroughness, will give satisfactory results, and of starting the discussion of a subject that is to me very important, and one upon which I wish to become more thoroughly informed.

PTOMAINES.

BY PROF. CHAS. MAYR, SPRINGFIELD, MASS.

READ BEFORE THE UNION MEETING AT BOSTON, JULY 11, 1888. ABSTRACT BY
IRA G. BAUMGARDNER, D.D.S., PHILADELPHIA.

Prof. Mayr began his address by referring to the danger run by physicians of inoculating themselves in making autopsies, and performing surgical operations in certain cases. He said that the theory which had held sway for many years of a chemical poison had been disproven. It is not the action of a chemical poison in these cases, but of an infectious agent which enters through the wound, and afterwards develops within the body. These micro-organisms in their growth throw off certain waste products which

are called ptomaines. A very large number have been tabulated. Other products of life force have been discovered, as, for instance, leucomaines—a substance produced during digestion, and under physiological actions throughout the body. But leucomaines have not been sufficiently isolated and identified to speak of them as distinct chemical individuals; for we can speak of chemical individuals just as well as individuals in mineralogy. Leucomaines have not been, as yet, scientifically individualized, therefore are supposititious bodies. Ptomaines on the other hand are distinct chemical entities. If any of you have had any experience in photography you know that, in making "blue prints," the color is produced by the reducing action of the solar rays. Some ptomaines have the same reducing power. If a few drops of the chemical mixture used in photography in making blue prints are allowed to fall into a mixture containing ptomaines the solution will immediately turn blue.

It has been claimed that all retrograde processes in the human body are putrefactive; even the production of alcohol can be proven to be a putrefactive change. It is merely "a hair splitting of words" to call one fermentation and the other putrefaction. Prof. Brieger took five hundred pounds of horse flesh, and allowed it to putrefy for two weeks, after which he obtained $\frac{1}{2}$ of an ounce of ptomaines. The most abundant ptomaine found by Brieger was termed *neuridine*, which when isolated resembles somewhat salt-petre crystals. It is entirely harmless. The next compound discovered as a result of the putrefactive process he termed *cadaverine*, another *putrescine* and so on, each name denoting the source. These are all comparatively harmless. The only one isolated that was poisonous was termed *nerisine*. He estimated that it would take $\frac{1}{4}$ of a grain of this to kill a human being. Brieger has also investigated the waste products of several disease germs; notably that of typhoid fever (in which he discovered a specific poison, which he denominated *typhomazine*, suggesting that it was a toxical product. Prof. Mayr considers this Brieger's most important discovery. He allowed the germ of typhoid fever to act upon raw meat and obtained the poisonous principle from the extract. He was enabled by experimentation upon rabbits and guinea pigs to produce many of the typhoid symptoms. Other symptoms present he attributed to vital reaction. Brieger carried his ex-

periments into the realm of tetanus. It has been found that lock-jaw is produced by a specific micro-organism which enters the system by means of a wound, sometimes that of a rusty nail, which makes an ugly wound that does not heal readily. Brieger obtained from the product of this germ a new ptomaine called by him *tetanotoxine*, which is produced in the circulation by the germs.

He investigated certain clams, called *mytilus*, found on the English and Continental shores, and very similar to our Long Neck clams. One day fifty persons became sick from eating clams procured from the North sea. Some of these were sent Dr. Breiger, and he discovered a poison which he called *mytilotoxine*, which could only be procured in very small quantities, but which was very intoxicating, fully 120 times as much so as alcohol. The first effect, when poisoned by it, is an excessive exhilaration; soon, however, followed by great depression, in which stage many die.

In making these investigations the substance is allowed to putrefy—then the fluid is filtered out and concentrated and precipitated by bichloride of mercury. All the ptomaines combine more or less readily with sublimate and are liberated by sulphurated hydrogen. The most efficient antidote yet discovered for neurine and tetanotoxine is atropia. The symptoms of neurine poisoning in rabbits appeared very rapidly after the administration of the drug. The secretions of the salivary glands were markedly increased; great tears would drop down from their eyes, and in a short time they died without seeming to suffer any pain. These chemical compounds are seemingly very unstable. In making experiments upon putrescent masses, it was found that the ptomaines were most abundant at the end of one week; much less so at the close of two weeks, and that only ammonia remained after three weeks of putrefaction. In answer to a question from Dr. Atkinson as to whether any nitrogen entered into the composition of ptomaines, Prof. Mayr said: They are in their constitution ammonium bases—ammonia has the composition NH_3 , that is one cubic foot of nitrogen is combined with three cubic feet of hydrogen gas. If united with one cubic foot of hydrogen, we would have an organic ammonia, called mono-ethylanime, and thus by substituting one hydrogen after another by an organic radical we obtain all these organic alkaloids. The compositions of these complicated ptomaines has been very well established; for instance,

neuridine is represented by $C_{11}H_{15}N_5$. It is interesting to know that most chemical compounds found in the body are *ethyl* compounds; they contain the common radical of alcohol. In conclusion the essayist said: It is true that these facts are not directly transferable into dollars and cents in daily practice. I did not present them for that purpose, but with the view of interesting you in problems that belong to a wider sphere. It is only by reaching outside of our own walls that we enlarge our boundaries.

PRESIDENT ANDREWS' ADDRESS TO THE UNION MEETING.

Ladies and Gentlemen; Guests of the Union Meeting of Dentists:—It is an honorable privilege to welcome you and all to the hospitalities and fraternal courtesies of our city, and, in doing so, I may be pardoned if I acknowledge some little pride in being the chosen representative of so large a constituency of my brethren of the dental profession. I welcome you, not alone in the name of the Connecticut Valley Society; but the Massachusetts Dental Society also joins most heartily with us, in extending to you all a most cordial invitation to share with us the pleasures which have been provided for your entertainment. To our brethren from Canada, I would say, we have not forgotten the delightful memories of a year ago. In the growing interest manifested in our noble profession, you were foremost in extending to us, your brothers of this free Republic, the cordial welcome of your royal hearts. We have learned from you that fraternity knows no barriers of political difference; but that in the pursuit of knowledge, and in the development of professional skill, the true brotherhood of rights belong to all who are faithful in the discharge of honorable duty. I therefore feel a peculiar pride in giving you welcome in this old historic city of Boston, the cradle of our liberties, and the traditional mother of most of our intellectual activities. I recognize with grateful memory that the blood of our common heritage is the noble blood of England. We are blood relatives by our common ancestry, and, in this kinship, I bid you, as brothers, to share our pleasures. We shall not try to vie with you in the largeness of our scheme of entertainment, for we have been so well warned, by our experiences with you, that if we had fostered the spirit of emulation in this attempt to give you pleasure, we might have hesitated with wisdom for our journey. We shall never forget

your lovely city and its many places of public interest; our delightful rides through your rich valleys, and over your noble rivers; nor the *grand* old pinnacle of Mount Royal, where beneath our feet we saw your splendid country spread out like a land of promise. We cannot forget your untiring and painstaking energy to open every avenue of enjoyment to our willing eyes; and now, that you are our guests, we want you to thoroughly rest, and let us do the serving. We throw open to you the doors of every place of interest, and bid you enter and enjoy yourselves. Old Boston has the reputation abroad of being a very crooked city. It matters a great deal to you, as it does to us, how that reputation is interpreted by the visitor. We make no boast of exceptional morality, but if by crookedness is meant successful uncertainty of street terminations, we have only to caution you the *straight and narrow way* is sometimes a fond delusion in Boston. But let me add, that to get lost anywhere in this town while you are in our hands will be a moral impossibility. We know that you will respond cordially to the sentiment of the profession, and its earnest friends everywhere, that dentists, as a class, are always safe in council, as they are in practice, and that wherever progress means enlightenment and scientific advancement, the profession of dentistry with even and steady step marches in the front rank of honorable consideration. The citizens of this old Commonwealth will therefore feel a just pride with us, in having among them as guests, our brethren of Canada, as well as those from our own States, who have done so much towards maintaining the dignity, and elevating the practice of a profession that has been such a blessing to humanity. In the name of our brotherhood of dentists I extend to you again a cordial welcome, expressing at the same time my sanguine hope that this reunion will redound to a closer friendship, a warmer sympathy of professional interests, a deeper realization of our unity, and, above all, a steadier advancement toward the attainment of our highest ideals of professional success. May your visit be one of continual pleasure, and when you seek again the busy round of daily duty, among the brightest pictures of your imagination,

“As dreary time,

Leans on the hand of thought,”

May you, looking backwards, recall, with pleasant memories, your visit here.

Reports of Society Meetings

PENNSYLVANIA STATE SOCIETY

TWENTIETH ANNUAL MEETING

REPORTED FOR THE INDEPENDENT PRACTITIONER.

BY IRA G. BAUMGARDNER, D. D. C.

CONTINUED FROM PAGE 236.

Discussion on paper read by Dr. E. C. Kirk, entitled "The Implantation of Human Teeth," and printed in September number.

Dr. Gerhart—I would like to ask Dr. Kirk how long those teeth had been extracted before they were implanted.

Dr. Kirk—I cannot give the ages of them. I have disregarded the question of the length of time the teeth had been extracted. They all had been out three months, and I may add that in the letter Dr. Herring wrote me, he stated that he had used a tooth he found in an old chest, the key of which had been lost for seventeen years. I do not think the age of the extracted tooth has any effect upon the operation.

Dr. Gerhart—I asked the question because I never used a tooth for transplantation that had been out for a long time. During this time of apparent death vitality seemingly remains in the periosteum. My friend, Dr. Beck, said the other day that he did not believe it possible that a tooth could be vital to a socket after extraction, and while I doubted it, yet I have had such experiences that it seems to me that it must have vital union. Even after the tooth had been extracted four months, and the question I would like to have answered is, whether in this apparently dead periosteum of the tooth vitality is capable of restoration at any period. If a tooth will remain alive for seventeen years, why not for fifteen years? And the question is whether it has the same vitality as the latent germ.

Dr. Kirk—I would like to ask Dr. Sudduth to answer this question, as he has worked up this subject very thoroughly.

Dr. Sudduth—See editorial in September number.

Dr. Gerhart—So far as Dr. Sudduth has answered my question, he has confirmed the opinion of Dr. Beck; it is a mechanical union. The reason I differed from Dr. Beck was on account of my own

experience. Something like ten months ago, a young man presented himself with a central incisor which had been kicked loose by a horse. For several years it suppurated. He broke off the crown, and presented himself to have a crown put on; but on account of the great size of the apical foramen, I proposed transplantation of another tooth—one lying around for several years. Upon the extraction of the root, there was not a vestige of any alveolar process upon the labial aspect. The gum and the soft tissues were flaccid. The tooth I implanted was too small for the socket, and had to be held in place by means of ligatures. The tooth in position was a trifle longer than the mate in the mouth, and in the process of healing or attachment, or whatever you choose to call it, the tooth was drawn up—drawn up so as to be one-sixteenth inch shorter than the other teeth. I do not see how that could be accomplished except by vital action between the periosteum of the tooth and alveolar border of the palatine aspect. It is only two weeks since I saw that case, and I could not explain the reason for a tooth being drawn up except by union of periosteum and socket of that tooth and alveolar border. There can be no explanation, because it is not held there by ankylosis, and if there had been no union it would have dropped out.

Dr. Sudduth—May I ask the gentleman if it had other articulations—had an opponent?

Dr. Gerhart—It had.

Dr. Sudduth—Was the tooth too long?

Dr. Gerhart—There was occlusion of the two teeth.

Dr. Sudduth—If the shortening cannot be accounted for by occlusion, it may be because of the cicatricial tissue which surrounds the root, as the speaker says that there was not bony ankylosis in this case. In regard to the question of revivification of tissue, many experiments have been made. Tissues live longer than might be supposed; but the length of time is counted by hours, and not by days or years. Many experiments have been made in skin-grafting. A friend of mine in Chicago sent clippings of skin from the surgical cases occurring in the hospital daily to a friend of his in Wisconsin, who grafted them on an indolent ulcer. Some of them were detached as long as thirty-six hours, and were transported through the mails, yet grew. They were kept moist, and every precaution taken to treat them antiseptically. I do not

for one moment believe in the theory of re-implantation of the pericementum on implanted roots. It's foreign to all our ideas of life.

Dr. Faught—I am very much interested in this subject, and have been since it was first introduced. As much as I have been in dental literature, and from the same standpoint, I must confess I have not had confidence enough to perform this operation, and while I do not want to say anything against the theory that would deter others, I still want to say that the saying, there is no danger, should be taken with a good deal of consideration. I do not think we ought to run blindly into the operation, even with the antiseptic treatment. Dr. Barker was an enthusiast in this matter. We remember the success he had, but in late years he said: "It is a thing I want to take back; it is a thing I want you all to very careful of." We all know the history of the case. I would hardly like to see the subject passed without raising my voice, even if I cannot raise it from a practical standpoint.

Dr. C. B. Kratzer—I would like to ask Dr. Kirk whether, in this operation, he pays any attention to the pathological conditions while it is removed from the socket. Now all of us extract teeth; the pericementum is often partially denuded from the root, and I should like to know whether Dr. Kirk would implant such teeth, or whether he wants perfectly sound teeth, and if the latter I think it will destroy the progress of conservatism in dentistry.

Dr. Kirk—In reply to Dr. Kratzer, as to whether I use any care in selecting the tooth, I thought I had covered that point in the paper. I suppose I have had quarts of teeth sent from various places to know whether they were good. I stated in the paper that they should have their pericemental covering intact. I certainly take the greatest care that they shall be perfectly healthy. As to destroying the principle of conservatism, I do not think it has any influence upon the subject. If a man is going to be influenced by it, he has no right to practice dentistry. The same might be said of whiskey and high license. I am sure I have not kept order on account of the decrease in number of saloons. I am glad Dr. Kratzer has made the point he has, and I hope discussion will be brought about. I am earnestly and honestly seeking any evidence of harm that has or can result from this operation. Now I say that the gentlemen who make the severest criticisms or questioning as to the dangers or advisability of the operation are those

who have not seen the operation. I am reasoning only from my own results, and with regard to the special operation Dr. Faught has referred to of Professor Barker's terminating so disastrously, we have heard all kinds of versions as to its cause. I want to know from somebody who knows everything concerning that operation and the cause of his unfortunate result, because I have had the version of so many that I do not know what did take place. In regard to Prof. Barker reconsidering his views of transplantation, he was equally rabid in regard to nitrous oxide, and yet we all know its value.

Dr. Smith—I have been one of those who have been fearful of treading the path of replantation or transplantation. I do believe there should be great caution taken in this matter, but I do not consider when a man tries a new thing that he is foolish by any means; but there may be fools who might undertake it, and, therefore, Mr. President, we should be very cautious in working upon a variety of diatheses. It has been spoken to-day that we must remember we are working upon living tissues with dead matter, and therefore we should be careful, and Dr. Barker has left us in his memoirs something to think about and to ponder over. I remember something about the case, but I would not like to go into details; but to cover the whole matter, it was a matter of diathesis. The trouble Dr. Barker had in his hands turned out to be tetanus, and, of course, was likely to lose the patient's life. It occasioned a great deal of discussion at the time, and especially by Dr. Barker, who had cautioned the young and old of the profession to be careful in this matter—to know whom they were going to operate upon, and I would caution Dr. Younger, if he is present here to-day, and the doctor who wrote the paper, to be very careful whom they select, for they are going to drill into a jaw-bone. The work may be done excellently; but there are contingencies in the matter, and he must take precaution. I know every professor, or any man of experience here, will bear me out in the saying, to be careful in these matters, for if there should a death occur, a great loss of patients would result. It not only reflects upon the man but upon the profession, and we do not want to be the laughing stock of the medical profession. Now, in the growth of tissue, I believe that as long as there is a living cell there we will have growth, but when the cells are dead there will be no

more growth. If you stick a branch of a tree in the ground—I stuck one in the ground a long time ago, and did not think it would grow—but it has taken root. There were no roots, but there were cells there. But where we have a tooth root that has been out six months or nine years it is dead matter, and never can grow; and as my friend awhile ago rightly said, it is not a matter of growth, but of ankylosis.

Dr. James Truman—I do not want to say much upon this subject, for I know little about it; but the matter brought to mind of Dr. Barker, a colleague of mine, occurred ten years ago, and it has become dental history. I do not regard the two cases at all as the same. Dr. Barker, as you know, removed four or five teeth from a lady under supposition that there were growths at the roots—nodular deposits. He replaced those, and the last tooth he replaced caused the death of the patient. What were the conditions of that period? Antiseptics were scarcely known. He probably used nothing in the way of an antiseptic or germicide upon the necks of those teeth. If he had known it reflexively at that period, the case would not have resulted as it did. Then, again, there was more or less irritation. The periosteum was in place, and the pericementum was also in place; and placing a tooth back under those conditions was different from the plan of Dr. Younger, as illustrated by Dr. Kirk this afternoon. I have seen a number of cases, and I cannot see the great danger that is attributed to it. The cases are not synonymous at all. The only danger I do see in the bicuspid teeth is entering into the antrum. It struck me that, in careless hands, this might occur; and I should think it would cause great irritation during the process of healing. I believe that Dr. Sudduth has covered the whole ground in regard to the fastening of the teeth, and it occurs to me why we use natural teeth at all? Why not use porcelain teeth made with depressions or screw-like forms? and then we would get rid of all danger of transmitting disease from one patient to another.

Dr. Guilford—There are one or two things about this operation that have not been brought out. In regard to this operation, we did not know what had induced Dr. Younger to begin; and he being a Californian and we here, most of us said, "There is another fool;" because we thought that we knew all about it, and that he did not. When he came East, there were very few places where he

got to operate upon patients. Practitioners would not go, and said it was unphysiological. But when Dr. Younger inserted a tooth in the process, and it grew fast, there was evidence that something had taken place to make it unite to this tissue. Then came the question, How can this be done? Dr. Younger said that the tooth should be covered with pericementum. As Dr. Smith said when the tooth is dead there can be no life, Dr. Younger could not tell how the tooth was held, and thought it had a living attachment. How could it be when the pericemental membrane was dead? He did not know; but was willing to let them examine the case and see for themselves, and explain why this took place. Dr. Atkinson took a small bistoury and passed it up; and when he withdrew it there was blood, and said there was a living attachment. He was both wrong and right. The question of the whole subject is, What sort of union takes place? Dr. Kirk has given the best hypothesis in regard to this, and, to make it brief, it is about this: that while the pericemental membrane cannot be revived, it can act as a leader to the tissue and into the opening into the cementum; and while it is held there, it is not because it fits the root, but has little processes running into the cementum that hold it there. If you use porcelain teeth, the living tissue will not get into it, and consequently will not bring about union. There perhaps may not be a living for that socket; but there is a healthy growth there which takes hold of this dead pericementum, which acts much like a sponge; but with the smooth surfaces of the porcelain tooth the same results would not be produced.

Dr. Kingsbury—I find that Dr. Truman has anticipated a line of thought, and remarks I had in mind, particularly in reference to the case referred to, that of Dr. Barker. I was conversant with the case. Dr. Barker and myself were very well acquainted, and one day he called at my office, stated the case to me, and desired me to come around to the Pennsylvania College, and hear his statement of the case, and that a number of the members of the profession were invited to be present. The fact is, Dr. Barker had become apprehensive of some unfortunate and, perhaps, fatal results. He made a statement of the case and, as far as possible, received the indorsement of the medical profession, and he desired, as was natural, to receive the endorment of the dental profession. The operation was a very unfortunate one; but there was no simularity between

that operation and the one now practiced by Drs. Younger and Kirk. In Dr. Barker's case five or six teeth were extracted, one after the other, as a remedy for neuralgia. After all efforts failed to give her relief, he concluded to extract the anterior superior teeth and excise the point. He did so and, upon inquiry, he stated to me, he did not file off or smooth in any way the ends of these roots after they were excised, but left them with the *sharp points* and cutting edge; and I am quite sure that the roots inserted in the sockets becoming such a severe excitant to the general nervous system produced the tetanic effect which resulted in her death. It was hushed over as much as possible. The sympathy of the profession was with Dr. Barker. He was experimental in his way, and was prone to efforts for advancement in science, and this particular case was a fatal advance; but I think there is very little danger from the operation of Dr. Younger. When I first heard of the operation of Dr. Younger, my mind reverted to other operations somewhat similar in their character. In the first year of my practice in extracting a molar, I extracted the wisdom tooth also, the roots of the second molar were united with the roots of the second molar in such a way that the latter was forced out with the second molar, and perhaps a little inexperience had something to do with it. I replanted it, and it became very firm, and the last I heard of the tooth it was a useful tooth in the mouth. The operation of transplantation of teeth is more than one hundred years old. It was very popular among French dentists at one time, and has been done in this country, and there have been many, more or less, disastrous consequences by the inoculation of disease from one person to another. I have been very much interested in it, and regard it as a phenomenal operation, a marked indication of advancement. I would not attempt to explain how a tooth that has been deprived of its vitality, and inserted into a living tissue, will become so firm and hard, as we find in these cases. I had an opportunity to examine a number of cases, several performed by Dr. Kirk, and I have been astonished at the firmness of the tooth in the maxilla. I did not think the periodontal membrane is essential to the success of this operation, as seems to be inferred from the remarks of Prof. Guilford, but believe that even if the tooth was deprived of the covering, it should be as successful. I do not see why it should not, and I would like to ask if it is essential. If you

scrape off the pericemental tissue, would not the chances be as favorable for the operation?

Dr. Kirk—I think not; but I simply speak from a clinical standpoint, and not from any theory which I have. Dr. Younger has had several teeth implanted in his own mouth, and one that I saw extracted about a year ago was much absorbed upon one side, and was altogether in an unfavorable condition; so much so that I thought there was no doubt of its ultimate failure had it been left for a time. Dr. Younger told me that the tooth he used in that case had a defective membrane. A microscopical examination developed the fact that while there was good union on one side of the root, upon the other absorption had made deep inroads upon the cementum. While I do not have any faith in the theory that the pericemental membrane is in any sense revitalized, I am rather inclined to the idea that a tooth with its membrane adherent and perfect is a source of less irritation to the tissues when introduced, and the process of healing is thereby more favored than it would be if the membrane were removed or imperfect.

Dr. Kingsbury—That is quite an important point to be borne in mind, but I think still it must be conceded that there is no more vitality in the pericemental membrane than there would be in the cementum itself. I cannot think there is any degree of vitality remaining in a tooth after it has been absent from the mouth for so long a time, and in the line of experiment I think it would be well to try scraping off the membrane of the root, and insert it in the regular way by Dr. Younger's method, and see if the operation would not be as successful as with it. I believe it would be, and if it would not be I could not favor the opinion of Dr. Truman that porcelain would work at all. If the membrane is necessary, then porcelain could not be used. I have not felt like going into this line of practice myself, and the chief reason is that I have not as much confidence in the value and permanence of the operation as many seem to have.

Dr. Guilford—I would like to remind Dr. Kingsbury that sponge has no life in it, and yet it fills an important part in the production of tissue.

Dr. Litch—I did not have the pleasure of hearing Dr. Kirk's paper, but it seems to me that there are certain states of the system that would make the operation a dangerous one. I would

select very carefully my patient, being careful to avoid veretaneous conditions, etc. I am not fully convinced of the permanency of the operation. We must remember that the tissue holding it in place is cicatricial tissue, and is liable to accidents, and with sometimes melt away. Of course you must take these points into consideration in determining the operation, and the patient should be notified of the possible risk and failure. There has also been mentioned the danger of entering the antrum in the case of the bicuspid teeth. It would result in inflammation of the membrane of the antrum, and might produce necrosis. The operation of Dr. Barker's was performed under different conditions, and, as Dr. Kingsbury has remarked, the end of the root cut off, and not filed, I think that that condition largely accounted for the result.

MORNING SESSION, JUNE 7TH, 1888.

PAPER READ BY DR. W. E. MAULE, ON "IRRADIATING AND TONIC CORRECTION."

DISCUSSION.

Dr. Guilford—The only thing we can do with a subject of this kind is to take up one or two points the essayist has touched upon. One of these points is in regard to the extraction of teeth either as a preventive or corrective method. It is one of those things which requires the highest order of cultivated judgment, and also experience, because if it is done judiciously and wisely, it is one of the best things that can be done; injudiciously and unwisely, one of the most harmful. When people ask whether I extract one or the other, I say it all depends upon the surroundings. Very often we can postpone the extraction of a tooth until we can see what the results are, and then, if necessary, we can extract it. Individuals are sometimes in doubt as to whether they should enlarge the arch or extract the tooth. It is a hard question to decide, and hard to know what to do after the arch is expanded. There is another point which wants to be carefully looked at, and one I teach young men, and that is the inherent force of nature, a tooth out of position comes into position if the opportunity is offered. It only wants room or removal of the obstacle in its way. There are no teeth that possess this power as the cuspid teeth. If there is no room for them in the mouth, remove the bicuspid, and the cuspid comes into its place. It is the inherent force of nature. Some years ago, I had a patient, a young girl, who had a cuspid tooth outside the arch, not

of line. The second bicuspid was very good, and the molar somewhat bad. I said I would extract the first molar, and then bring back the bicuspid, and draw the cuspid into place. I put an appliance on the second bicuspid, and I was told the appliance hurt so much—ligatures, etc.—that the father cut it off, and decided to abandon the case. About two years after that she came back to have her teeth filled. I saw a beautiful arch. I said, Miss A., you have been to a dentist, and had your teeth regulated. She answered, no. I asked her, have you had nothing done to bring the teeth into place? She said, no. That cuspid tooth had forced the other tooth back, and come into place. I make this point to show the inherent force of nature, even against certain obstacles. There often is difficulty in the cuspid teeth where they do not erupt into line. If you can preserve a space for them, they will come through of their own accord. If we give nature a chance, she will do much for us, and very thoroughly.

In regard to interrupted and continuous pressure, Dr. Magill prefers the interrupted. I have studied this very much, and I have had good results in both ways. I have had good results quicker with the continuous. I think experience shows that the action of the metal spring, or anything else continuous in its character, will move the tooth all right. I find that in continuous pressure, leaving out soreness, there are no bad effects.

Dr. Kingsbury—Where the inferior incisors come anterior to the superior incisors, the sooner that form of irregularity is remedied the better. From the time of eruption of most teeth—say up to the period of ten years—from that time up from five to six years there is an enlargement of both jaws that many do not take into account in considering the question. While there may be a crowded condition of the teeth at ten or twelve years, five or six years afterward this irregularity may disappear. I regard it as a radical error for a dentist to extract a cuspid tooth except in marked cases of irregularity. If the first bicuspid is extracted, there is usually no difficulty, with the enlarged growth of the jaw during the succeeding year, in bringing the cuspid down into its position. In a like case it is good to extract a second bicuspid to meet a difficulty of this kind, rather than the first one; because the second is more liable to caries than the first. In all cases where the second is extracted, the first will recede, and the cuspid come into position.

Dr. Chupain—I was about to make the same remarks that Dr. Kingsbury made when he arose before me. I think one of the most important cases that call for the interference of the dentist is when the superior teeth close inside of the lower teeth. Such a deformity will not be rectified by extraction of any teeth, and will only be met by the interference of the dentist.

AFTERNOON SESSION, JULY 10TH, 1888.

UNION MEETING OF THE CONNECTICUT VALLEY AND MASSACHUSETTS DENTAL SOCIETIES, JULY, 18-8. REPORTED FOR VICE-PRESIDENTY, PRACTITIONER BY IRA G. BAUSCHARDNER, D.D.S.

DISCUSSION ON PAPER READ BY DR. S. S. SNOWELL, ON "THE CASE OF COPPER AMALGAM."

Dr. E. A. Bogue, New York City—I do not know that, unprepared, I shall be able to say anything on the subject now before the meeting. I did think while the essayist was reading the paper, that what seemed to me a slight exaggeration in his view of material might, perhaps, be corrected. It is true that copper amalgam has been used for many years with great success and benefit. It has also been shown that certain specimens of this material have proven themselves destructive. What specimens are destructive, and what are not, I am unable to say. My assistant, Dr. Rootger, showed me, more than a dozen years ago, fillings in his mouth that his father put in twenty-two years previous, using copper amalgam. They were on the grinding surfaces and were good. Within the last five years I have seen a good many copper amalgam fillings that bore an appearance, as far as distinctibility is concerned, like oxyphosphate; they were cupped on the surface and granular. It is true that copper amalgam will not shrink. It is also true that palladium will not shrink. It is not, I think, quite true, as I have already said, that copper is indestructible. It is an oxidizable metal, while palladium—one of the noble metals—is not oxidizable. It is true that copper may be manipulated so as to set rapidly. Palladium can scarcely be manipulated in any other way but rapidly, so that contour fillings can be made with it. When finished, both are intensely black.

There was one remark Dr. Stowell made I should like to take exception to, that he could face his copper amalgam with which he

has called "high grade" amalgam, or gold filling. As I understand it, the copper amalgam has no affinity for another amalgam, and that if union does take place it is purely a mechanical one. If it is anything else I should like to learn it. I have never had any amalgam adhere.

Another thing he said was that the patient should be cautioned not to bite upon copper amalgam fillings for several hours. I think we should be pretty careful not to put any amalgam filling into teeth where the biting surfaces are concerned. It seems to me it is not a substance we can safely put on the biting surface, or where the opposing teeth come together. The amalgam is intensely hard and teeth elastic, and I have seen many teeth split in that process Dr. Stowell alluded to. Perhaps he endeavored to make the same point I do. Finally, Dr. Stowell refers to the antiseptic properties of copper. Inasmuch as I must regard all the bacterial inhabitants of the mouth as scavengers, I earnestly hope that copper will never be used in the mouths of our patients, relying absolutely upon the independent cleanliness of the copper.

Dr. S. J. Andres, Montreal, Canada—I never had any experience in using copper amalgam except when I was a young man studying the profession of dentistry, and beginning practice, a great many years ago. The only thing we used was the old "Spanish Quarter," making a filling that stood then, and will now, better than anything else. I have seen filling that had been in the mouth thirty-five years, and standing firm. I think that in the alloy of the Spanish quarter, silver and copper were the only two metals used.

Dr. G. H. Weagant, Cornwall, Conn.—I had the honor, last year, at Montreal, of reading a paper on the same subject, and I think covered all the points made to-day; and I believe I agree with Dr. Stowell in everything he said upon the subject, with the exception that I agree with Dr. Bogue in reference to making ordinary amalgams adhere to copper amalgam. The only way is to introduce one over the other. They will not adhere to copper amalgam.

In reference to the point Dr. Bogue spoke about, the copper looking like oxyphosphate filling, I think it was entirely due to impurities in the amalgam. That has been my experience. If the copper amalgam is perfectly clean, I do not think any such condition as Dr. Bogue mentions need occur.

Dr. B. A. R. Ottolengui, New York City.—In regard to copper amalgam, it seems singular that so much has been said in favor of it and so little against it. The result is younger men in the profession are likely to run into it to get out of their mistakes. It may be that copper amalgam is a fine germicide to stop decay, but it can only stop where it touches; and if a person is uncleanly, their teeth may decay where the amalgam does not touch, and they may fail when they reach that cavity, and the copper amalgam will not stop it from going under it. I allude to places where you put a copper amalgam in a posterior cavity of any tooth—lower molar, say—and then if, from uncleanly habits of the patient, a cavity forms decays on the lingual aspect, and burrows along the margin of the gum, and then under that filling, in the course of time the patient will come back with the filling loose. It is then necessary to take that filling out and refill that tooth properly, which is difficult for us to do, for the filling is so hard. This remark is not original with me; it was made by some other gentlemen, but I think it is a well taken point to warn us that when we do anything of this kind, to look out for the shade.

I have not had much experience in using copper amalgam myself. I have only used Dr. Russell's, of Brooklyn. It has not enough mercury to make a stopping. I understand Dr. Russell puts it under a hydraulic press, gets out the mercury, and then heats it up, and then renews the pressing of it three times. In this way the quantity of mercury is reduced to a minimum, and you have to add mercury to it to put it in.

In regard to facing the filling, you cannot work amalgam upon it well or use foil upon it, but you can burnish Watt's crystal gold into it. Whether that gives a good color I have not had time to find out.

Dr. J. H. Kidder, Lawrence, Mass.—A brother of mine, twenty years older than myself, one of the older practitioners of New Hampshire—even when amalgam was under a cloud—intensely stuck to his own experience, and filled teeth with it right along. I have now in my mouth fillings that he put in—made from silver dollars—that have been in there about fifty years. Some other portions of the teeth have been filled, and others of my teeth were filled with soft gold, which were not removed until several years ago. I then had them filled with oxyphosphate, on account of

their getting old and frail. As far as amalgam is concerned, I think it makes a good filling.

Dr. H. W. Clapp, Westfield, Mass.—I have very little experience with copper amalgam. I have used it a little for perhaps eighteen months, and so far as my experience goes I am very much pleased with it.

Dr. W. X. Sudduth, Philadelphia—This is a practical discussion which is almost entirely out of my sphere, yet the question was raised regarding the germicidal properties of copper amalgam. I have made a few tests in that regard, and my judgment is that its germicidal properties are very low indeed. Certain conditions may be brought about by which chemical changes will take place, and in that case it may have slight power as a germicide; but as a dependent I think its value is more due to non-shrinkage and adaptability, by which it forms a perfect stopping for teeth, thus preventing entrance of the micro-organisms into the cavity.

Dr. G. A. Maxfield, Holyoke, Mass.—I am a little disappointed in the way the discussion has progressed, as I was in hopes we would get a little more of the practical experience that some of the gentlemen have had. In my practice I want to use what is the best material, whether copper, gold or common alloy. I have not used copper amalgam very long. Dr. Weagant gave us an excellent paper at Montreal last summer, and since then I have experimented somewhat with it. I took his formula and made some for myself. I found I had an amalgam which was much the same as some that has since been placed on the market, which—after heating and crushing in a mortar—forms a dry powder, and we have to add more mercury to it. If, however, you heat it up three or four times, and work it thoroughly, it makes a very plastic filling, showing that there is plenty of mercury in the filling. The trouble was that we broke up the crystals by grinding in the mortar. If we can keep that crystallization, and not break it up, we get an amalgam that will set very readily, perhaps in ten minutes.

Now, as regards using it in combination with other alloys, I have done this: Use a matrix and hammer it in as well as possible with bibulous paper, and then I take my other alloy and put it in the same way. It may be a mechanical union, but the fillings remained solid. I cannot say how long they will last, for it is only

nine months since I began using the combination; but I saw some last week that had been placed in nine months ago that were as solid as when put in the mouth. The alloy on the surface has not changed color. There is a black shade where the two unite, but does not go up into the other amalgam. In regard to making the amalgam quick setting, I find that if you let the mercury just bubble, then you have a very dry amalgam.

Dr. S. S. Stowell, Pittsfield, Mass.—I wish to say a word in defence of my paper. In regard to the topping off of these amalgams with other alloys, my experience has been the same as Dr. Maxfield's. Whether there is a perfect union of metal I am not prepared to say. I only know I have made the combination filling without any failure or apparent separation of the top from the other. I simply know I have no failures of that kind that have come under my observation; and in regard to the filling becoming granular and cup-shaped, as Dr. Bogue has mentioned, I must claim that, when that result followed its use, it is due to faulty manipulation of amalgams. This amalgam may be heated and rubbed in a mortar, and become as dry as sand; and you begin to think that there is not sufficient mercury. The surplus of mercury is there; and, if you add any, there will be too much. If you put it back in the spoon and heat the amalgam again, you can produce a soft and plastic amalgam.

In regard to the introduction of this copper amalgam—the general use of it in this country—one dealer told me yesterday that, four years ago, he imported five ounces of the English copper amalgam. His men on the road took it around and showed it to dentists, and they did not want it. He now sells an average of two hundred ounces of copper amalgam annually. If used so extensively in this day of research and advancement, there must be something in it.

Dr. E. A. Bogue—Dr. Stowell states that the profession is now using two hundred ounces of copper amalgam where formerly four or five were sold. I think that reflects somewhat upon us as a craft. We are a little too apt to think of the last new thing, and run after it possibly too fast. Now, while I did not reach my majority until a few years ago—three or four—I am Dr. Stowell's grandfather so far as copper amalgam is concerned. When Dr. Stowell speaks of a combination filling, I am unable to compre-

hend what he means. If he means a cavity shaped like a well, not a well-shaped cavity, I can better understand him. Filling a posterior cavity open on two sides is a different thing. In the former case I can readily understand how he would get a combination filling that would show no disintegration between the two different metals; but in the latter case, a posterior proximal cavity, I cannot see how a filling would adhere or cohere with that amalgam, and would be interested in knowing how to do that thing.

Dr. Stowell speaks of faulty manipulation of copper amalgam being the cause of cupping. He will pardon me, I hope, for saying that fourteen years ought to give one some experience in manipulation; but I have had these fillings go back on me, and I wish to give a word of warning. I do recognize the great value of it in many places where other materials would be inadmissible. In all places hidden from view, where thermal changes would not be felt, there use copper, unless in proximal cases, where you cannot get it out again. There I should want to use something else.

I prepare copper amalgam exactly as Dr. Maxfield has described; and if there is a reasonable amount of mercury in it, it becomes, in my mortar, soft, although it may be so porous and granular that it seems impossible to get that copper into a mass. I then place in the bottom of the cavity Fletcher's copal varnish, so as to stick it in—in the tooth, of course. Then I put in my copper amalgam quite soft. The balance is squeezed out as hard as I can get it, and if that does not satisfy me, I heat crystal gold in my alcohol lamp, and put on the surface until I have sponged out with the gold all the mercury I can get out. I then burnish the amalgam, and then have it almost as hard as I want.

Dr. S. J. Andres—I have seen somewhere the assertion that the use of gold in any shape to absorb mercury from an amalgam filling would injure it. I have used Watt's crystal gold for nearly two years to take up the surplus mercury. If it injures the filling I have been using it wrongly, and I should like to be set right.

Dr. Bogue—It will cause the filling to shrink.

Dr. J. G. Werner, Boston, Mass.—Some one has expressed the idea that he is not a "copperhead" to new things. It is the superficial theorist who takes the profession so readily. Because it is 200 oz. it should have no weight with the young men. I have

not used the article, and am pretty sure I shall not until I hear more of it, and I think the young men should be cautioned.

Dr. S. S. Stowell.—I have always selected my cases. I do not use it when the teeth are hard and strong. I use it to accomplish a thing I could not accomplish in any other way—in teeth that are chalky and soft, and seem to defy our best efforts by other means.

Dr. G. A. Mayfield.—In regard to the 200 cc. of copper amalgam, I think as a rule our profession is very conservative. There has been a great prejudice against copper amalgam because it is black. I was of the same opinion, and would not use it until I heard Dr. Weagant's paper last year. I think one thing that has brought about such a large sale of copper amalgam was the statement of Dr. Miller. He made a series of very careful tests, and demonstrated that copper amalgam was the only filling material which the gums will not live. I think the profession will take that as reliable. There are very few of us who can make these tests. We have got to go by teachers. If they are reliable we can then adopt the different materials. We do not know how some of our patients clean their teeth, and we must treat their teeth in such a way that the germs will not start decay again.

Dr. G. F. Waters, Boston, Mass.—I have noticed that all of those who have spoken of this copper amalgam state they put it into the hand and work it. One statement made was that if there were impurities in the amalgam, then it would not stand well. What is the result of working amalgam in the hand? Your hand is full of pores, more upon the palmar surface than on the back side, and which are affected by alterations of pressure. The glands are thus brought into a state of active secretion, and the effete matter of the body is thrown to the surface. You are mixing with that amalgam carbonic acid, and perhaps carbonic oxide and perhaps sodium, and possibly chloride of sodium, and what is the result? It certainly is not a pure mass you are putting into the tooth. I never mix amalgam in my hand, because it is not possible to obtain a pure mass in that way.

Dr. D. D. Peabody, Stoneham, Mass.—I will say, in answer to Dr. Waters, that if he will cover the hand with rubber dam and cover the finger with kid, the difficulty mentioned can be easily overcome.

[To be continued.]

Editorial.

SACCHARINE.

This newly discovered quintessence of sweetness is now being largely used in the arts and medicine, and gives evidence of, in time, becoming a formidable competitor in the open market with sugar. It has already, in some places, supplanted glucose in the manufacture of confectionary. It is extensively used as a sweetening agent in the manufacture of beer by the Germans, so much so that the English papers are advocating its use in England, as the German article, so made, can be sold much cheaper in England than the home-made article, and is thereby undermining them in their own market. Its place in our pharmacopœia is not as yet established. It does not appear to have any effect upon the animal economy, and it was this supposed characteristic that caused it to be hailed as an excellent agent in cases of diabetes mellitus. It was also said to act very happily by internal administration in cases where there was a tendency to ammoniacal change in the urine in chronic cystitis. It has been found, however, that when persistently taken dyspeptic symptoms are very apt to intervene, and that care must be observed in its administration. It is eliminated from the body by the kidneys unchanged, and the fæces of patients taking saccharine do not ferment easily, nor does putrefactive changes set in as soon as in other cases. There can be no question regarding its antiseptic qualities; but the *modus operandi* has not as yet been determined. The most plausible explanation is that it forms an unsuitable culture media. It is said to be non-fermentable, and has the property of preventing lactic acid fermentation; also prevents the inversion of starch into glucose, and therefore forms a good addition to our tooth powders and washes.

PHYSICAL APPEARANCE AND CHARACTERISTICS.

Saccharine is a pearly white powder of a low crystalline structure belonging to the monoclinic system. It is slightly soluble in cold water, more soluble in hot, and freely so in boiling water; but it is precipitated again upon cooling. When in solution it gives an intensely sweet taste, which is not perceived so distinctly when the powder is placed upon the tongue. The solution is strongly acid, and by neutralizing it with potassium hydrate or carbonate

the fluid may be made to take up a larger per cent. of the drug, but which separates again upon acidulation. Saccharine is freely soluble in alcohol and fairly so in ether. The powder has an odor not unlike bitter almonds, which is intensified by heating. It is ten times sweeter than cane sugar, having the property of transmitting a distinctly sweet taste to 70,000 times its own bulk of fluid. The English manufacture it in quantities, putting it up in one-ounce packages, and furnishing a small horn spoon that will fit about one-half grain, which is all that is needed to sweeten a cup of tea or coffee. Some persons soon tire of its peculiar intensely sweet taste, which seems to grow more and more. This may be because its qualities are more intensified as it is diluted. The addition of saccharine to tooth powders and washes in the strength of $\frac{1}{4}$ grain to the ounce will undoubtedly have a beneficial effect in preventing lactic acid fermentation, and thus have an antiseptic action on decay. There is no question but that it will come more generally into use as an adulteration for sugar. All should, therefore be familiar with the tests for the pure article. We have collected a few tests which we here append.

TESTS FOR SACCCHARINE.

"It fuses at about 372° F.; when fused upon platinum-foil or porcelain it emits a distinctly perceptible odor of oil of bitter almonds or essence of mirbane, and finally burns away without leaving a residue; a white residue would be evidence of mineral adulterations.

Four grains of saccharine should render a clear solution when agitated in a test-tube with 2 drachms of concentrated sulphuric acid; upon gently heating this solution it should remain colorless; an ensuing brown or darker color would indicate an admixture of sugars or other organic adulterants.

An additional test for the addition of grape-sugar consists in dissolving 4 grains of the saccharine in 1 drachm of official liquor potassæ, which should remain colorless upon heating for 15 minutes. The same solution, when mixed with $\frac{1}{2}$ drachm of *Fehling's* test solution and heated, should not render a brick-red turbidity; else grape or milk sugar is indicated."

TESTING SUGARS FOR SACCCHARINE.

"In order to examine common sugar for an admixture of saccharine, respectively a substitution of cane sugar by grape-sugar

sweetened with saccharine, the following simple test is recommended: A test-tube, pointed and open at the lower end (a glass syringe answers best), containing about 1 fluid ounce, is closed at the lower orifice by a piece of cork or rubber and is filled with the coarsely powdered sugar to be tested; the tube charged with the sugar is then filled with ether and is left standing for about one hour; then the lower orifice is opened and the ether allowed to flow off into a small porcelain capsule; by placing this on a moderately warm place the ether evaporates, leaving any traces of saccharine behind, which is best and very perceptibly recognized by its extremely sweet taste. It may further be recognized by fusing in the capsule containing the ether residue, at a very gentle heat, a few grains of a mixture of 6 parts of sodium carbonate and 1 part of potassium nitrate; subsequently the fuse is heated to redness. The residue, when cold, is dissolved in a little distilled water, and the filtered solution is tested with a few drops of test-solution of barium chloride. An ensuing white turbidity of barium sulphate would prove the presence of saccharine, which forms at such incineration sulphuric acid, whilst no other sulphates possibly contained in the sugar would be extracted by ether."

THE CONNECTICUT VALLEY AND MASSACHUSETTS UNION MEETING.

It was our first visit to the Hub, and we were cordially greeted and entertained throughout our stay. The meeting was a most decided success in a social as well as in a scientific way. The people of New England surely are adepts in the art of entertaining. It is said that they make acquaintances slowly, but never forget a friend. With the remembrance of the pleasant time had by them as the guests of the Montreal Society last year, they planned an elaborate and thoroughly enjoyable return visit. The weather was auspicious the entire week. Every minute of which was occupied, either with clinics, papers, exhibits or excursions, each vying with the other to claim the time of those in attendance. The work of the several committees was thoroughly done, not a single hitch occurring in the entire programme.

The social part of the programme consisted of first, an informal reception at the Brunswick, Tuesday evening, followed by an elegant lunch. The hosts, with their ladies to the number of 100,

received the Canadian dentists and their ladies, numbering 40 or more. The whole evening was spent in a way calculated to give all hands a cordial acquaintance with each other. The visiting dentists present were Drs. S. J. Andres, J. A. Bozine, J. Robert, G. W. Lovejoy, Alfred McDermid and A. Riveston of Montreal; A. W. Hyndman and L. W. Dowlin, Sherbrooke, P. Q.; G. H. Weagant, Cornwall, P. Q.; Bescock, Rockville, Ont.; Coggson, Quebec; C. N. Pierce and W. N. Sudduth of Philadelphia; H. E. Noble and D. P. Hickling of Washington, D. C.; J. B. Little, E. A. Bogue, G. S. Allan and M. L. Rhein of New York city; C. D. Cook of Brooklyn; J. B. Prescott of Manchester, N. H.; J. W. Curtis of Brunswick, Me.; Thomas Fillebrown and the venerable E. Bacon of Portland, Me.; L. C. Taylor and J. McMann of Hartford, Conn.; F. Searle and C. T. Steukwell of Springfield; W. H. Jones of Northampton, Mass.; J. H. Kidder of Lawrence, Mass.; E. S. Gaylord of New Haven, Conn.; and William Barker of Providence, R. I. After dinner speeches were dispensed with and at a reasonable hour, as befitted the members of a dignified and scientific calling, the guests retired to rest feeling on good terms with their hosts.

All members and guests were supplied with badges that proved an open sesame to many points of interest, including the Museum of Fine Arts, Boston Society of Natural History, and the Cycloorama of Gettysburg and Bunker Hill. These the guests were enabled to see at odd times.

Wednesday afternoon cars were in readiness in front of the Brunswick for an excursion to Cambridge. Under the guidance of Drs. Andrews and Taft, of Cambridge, the party visited the Hemenway Gymnasium, where a short time was spent in examining the numberless appliances for physical training. On departing we were given a peep into the "trophy room," where the pennants and emblems of Harvard's athletic victories are carefully preserved. Memorial Hall was next visited. It was erected in the memory of Harvard's graduates who fell in the late rebellion. It is divided into chapel and mess-room, which latter is a place of special interest to Harvard's population, because of the fact that here the more substantial nourishment is dispensed. From here the party were taken to see the library, chemical laboratories, and the collection of minerals in Boylston Hall. A short visit was next made to the

Agassiz Museum, and afterwards to Peabody Museum of American Archaeology and Ethnology. The party was warmly welcomed by Prof. F. W. Putnam in a few, well-chosen words. All were highly pleased and captivated by the genial professor's untiring efforts to explain the object and contents of the museum, and his kind attention will long be remembered as an important part of the pleasant excursion. The collection of skulls is very large, and the teeth of various ages were examined with much interest by the visitors. There is, perhaps, no finer collection in existence, and all felt that many days could be profitably spent in their examination. The hour of departure came only too soon, and we tore ourselves away from viewing decay in *facto* to study it in *causa* in the evening, by listening to Dr. Allan's paper and looking at the beautiful slides exhibited by means of the stereopticon, and which formed one of the very many pleasant features of the week's entertainment.

DOWNER'S LANDING AND THE CLAM BAKE.

Thursday afternoon a trip down the harbor had been planned. Again cars were in readiness in front of the Brunswick, which were soon filled by some three hundred of the members, guests, and their ladies. After a circuitous drive past the most prominent buildings the Battery wharf was reached, and all boarded the steamer "Stanford," and we glided out into the pride of all Boston. In the inner bay the white caps were still running, the result of a storm the previous night; and before Fort Warren was reached more than one face had grown a shade or two paler. A landing was made and a visit to the fortifications was greatly appreciated. The stiff breeze on *terra firma* served to steady the nerves of those who had found it rather uncomfortable on the water. The next stop was at Downer's Landing, where a clam bake had been provided. Downer's Landing is the property of the Downer estate, Mrs. Dr. Littig, of New York, is one of the heirs. The genial doctor and family spend their summers there, and were present to welcome the visitors. It is quite a favorite temperance resort, no liquors of any sort being allowed on the premises. The buildings and grounds are well kept, and everything done to make the visitor comfortable while there. The dinner over, some time was spent in visiting the grounds and quietly chatting. The return whistle came all too soon. It had been intended to take in some of the principal

harbor public institutions, but on account of the rough sea it was given up. The chairman of the committee on entertainments, Dr. Shepherd, said it was a pleasure excursion, and if a single person would be discomforted by exposure it would be given up. He evidently found the single individual, for we came directly to landing about 7 P.M., feeling that an enjoyable afternoon had been spent.

Perhaps one of the most pleasant features of the union meeting was the presentation to Dr. Flavius Searle of a beautifully bound copy of the full programme of the evening session of the Connecticut Valley Dental Society, held at Springfield, Mass., October 27, 1887. It will be remembered that a surprise had been prepared for Dr. Searle, and was carried out with entire success, as follows:

After the reading of his paper, entitled "*Retrospect, or Some Reflections Based upon Experiences and Observations of Fifty Years of Dental Practice*," the discussion took the form of a series of congratulatory speeches and the reading of letters from those who were unable to attend. These letters, together with the speeches made, some forty in all, were preserved by the secretary, Dr. Maxfield, who, in accordance with a resolution passed by the Society, had had them handsomely bound in a beautifully type-written volume, bearing upon its cover the inscription: "*Presented to Dr. F. Searle by the Connecticut Valley Dental Society*." Dr. Searle is justly proud of the gift, as he well may be. It seldom comes to members of the profession to reach such a ripe experience in active practice, and the words of esteem so freely extended, prepared in such permanent and artistic form, cannot fail to become a valuable heirloom in the Searle family—a good name is more to be preferred than riches, says the good Scotchman—and Dr. Searle surely has one, if the testimony of his fellow practitioners can be relied upon.

THE EXHIBIT.

Through the untiring efforts of Drs. Horatio C. Merriam and W. E. Page, Secretary of the Committee on Exhibits, a most instructive exhibit was brought together. Dentists, by reason of the sedentary nature of their occupation, seldom get out among the manufacturers; but depend upon having their supplies brought to their doors by the dealers. As a consequence, a class of middle

men who, in most instances are manufacturers also, has been developed. They have put drummers upon the road, and sample cases are carried into every hamlet and village where there is any probability of selling a bill of goods. This arrangement has been agreeable and advantageous to the profession, as well as profitable to the dealer. A dentist's time forms his most valuable stock in trade. His working hours are limited, and his earnings go on only when *he* is attending to business; consequently he has very little time to run around looking up bargains, and as a result the profession has come to depend upon a few dealers for their supplies. And why a few? One would naturally suppose that supply and demand would, to a great extent at least, govern competition in the open market, and so it would in the dealings between any other profession and the trade. But in the matter of dental supplies an organization, offensive and defensive, has been formed by the leading dealers and manufacturers to keep up prices and cripple competition.

A prominent feature in American character is the desire to drive a sharp bargain. To be told that he cannot have an article any cheaper because the price has been fixed by "The combination," naturally irritates him; and while he may for the time being acquiesce, he naturally vows to get even some time or other. When a man's inherent right to purchase his goods in the open market is taken away from him he naturally rebels. Such has been the history of the operation of the combination in its effect upon the profession, and which resulted to produce the display shown at the Boston meeting. The profession gave expression freely to its feeling in the matter, and it remains to be seen what will be the outcome. It was a high pressure meeting all the way through. It took a great amount of energy to get up the exhibit, which was nothing more or less than a remonstrance against the combination, and was so considered by every dentist present at the meeting. As an independent journal it becomes our duty to record all matters of interest to the profession, and this surely was a marked feature of the Boston meeting, and one that forced itself upon the attention of all who were present. Whether any material good will result therefrom we are unable to say. At any rate for the time being the producer and consumer were brought more directly together than ever before. Much

depends as to whether those who were present will follow up this advantage by keeping their goods before the profession by advertising them in the journals that are open to receive their advertisements.

THE CLINICS.

The clinics also formed a prominent feature of the meeting and were fully appreciated. The forenoon of Wednesday was occupied by the operations of the following named gentlemen:

DR. W. P. COOKE, Boston, Filling with No. 30 Gold Füll.

DR. D. M. CLAPP, Boston, Combination Fillings.

DR. D. D. PEABODY, Stoneham, Mass., Clinic with Back Action Mallet.

PROF. J. BOND LITTEG, New York City, Porcelain Tips.

DR. G. F. EAMES, Boston, Regulating by Replantation.

THURSDAY.

DR. E. S. GAYLORD, New Haven, Conn., Plastic Gold Filling, Ivory Points.

DR. GEO. C. AINSWORTH, Boston, Soft Gold Filling.

DR. J. E. WAITE, Boston, Progressive Finishing.

DR. C. FRANK BLIVEN, Worcester, Mass., Filling with Electric Mallet.

DR. S. S. STOWELL, Pittsfield, Mass., Copper Amalgam Filling.

FRIDAY.

DR. E. C. LEACH, Boston, Porcelain Tips.

DR. D. F. WHITTEN, So. Boston, "Preparation of Approximal Surfaces."

DR. J. G. W. WERNER, Boston, "Marginal Cavities."

THE FOLLOWING MOTORS SUITABLE FOR DENTAL PURPOSES WERE ON EXHIBITION AND MOST OF THEM WERE IN OPERATION:

ELECTRIC.

The Barter Electric Manufacturing & Motor Co., of Baltimore, Md., through their agent, Mr. Frank Bidlon, of 178 Devonshire Street, Boston, exhibited their small Electric Motor.

The Geo. F. Card Manufacturing Co., of Cincinnati, Ohio, showed small Electric Motors.

The C. & C. Electric Motor Co., 20 South Fifth Avenue, New York, exhibited their Electric Motors.

The U. S. Electric Light & Battery Co., 161 Milk Street, Boston, had on exhibition their Batteries with Motors for dental and other purposes requiring two-horse power and less.

The S. S. White Dental Manufacturing Co. presented the Detroit Electric Dental Motor.

The Kellar Medicine Co., of Fort Wayne, Ind., through their agent, Mr. J. R. Baseman, showed the Woolley Magnetic Dental Engine, which was pronounced perfection by many.

GAS.

The Economic Gas Engine Co., 34 Dey Street, New York, brought out a one-eighth horse-power Engine.

WATER.

The Benham Hydraulic Motor Co., of Providence, R. I., were on hand with their small Hydraulic Motor, suitable for dental uses.

The Tuerk Hydraulic Power Co., office 12 Cortlandt Street, New York, had on exhibition one of their No. 9 Water Motors.

The Tuerk Water Meter Co., of Syracuse, New York, through B. L. Knapp & Co., 161 Tremont Street, Boston, showed one of their small Dental Motors.

S. G. STEVENS,

Evans House, Boston,

Secretary of Committee on Motors.

Current News and Opinions.

UNION MEETING.

The Fifth, Sixth, Seventh and Eighth District Dental Societies of the State of New York will unite in a joint convention at the Leland Hotel, Syracuse, Oct. 24th, 25th, and 26th.

The meeting will be called to order at 2 o'clock.

A cordial invitation is extended to the profession to be present.

An extensive programme has been arranged.

Prominent dentists from Chicago, Baltimore, Cincinnati, Philadelphia, New York, Boston, Toronto, Newark, Albany and other cities have consented to take part.

One-half day will be devoted to clinics, and demonstrations of improved methods of work and new appliances.

All the leading dental manufacturing companies have arranged to be present with a full line of their goods. They expect to outdo previous exhibitions in this section of the State.

Among the social features of the convention will be a banquet for the dentists and a reception for the ladies.

It is expected that dentists will bring their wives.

A ladies' committee has been appointed.

Syracuse.

G. L. CURTIS, Chairman Business Committee.

The Fifth Annual Meeting of the Ohio State Dental Society (reorganized) will be held in Cincinnati, Oct. 16th, 17th and 18th, in Lincoln Club Hall, Fairfax Place and Race St. A cordial invitation is extended to the members of the Profession to attend and bring their families.

Railroad rates on account of the Centennial Exposition are very low.

E. G. BERRY, Ed. Clin.

PROGRAMME.

- I. Obtunding Sensitive Dentistry. Levitt E. Carter, Dayton.
- II. Pericementitis. F. S. Maxwell, Steubenville.
- III. Machinery as Used in Dentistry. C. R. Butler, Cleveland.
- IV. Implantation, Replantation and Transplantation. H. A. Smith, Cincinnati.
- V. Examining the Teeth and Jaws of Skulls. E. G. Berry, Cincinnati.
- VI. Dental Education. J. Tatt, Cincinnati.
- VII. Medical Education for Dentists. C. M. Wright, Cincinnati.
- VIII. Volunteer Papers.

CLINICS.

Methods of Cleaning Teeth. Wm. Taft, Cincinnati.

Implantation. M. H. Fletcher, Cincinnati.

Operative Dentistry. D. W. Clancy, Cincinnati.

CAMPFORATED CARBOLIC ACID.

In the *Correspondenzblatt für Schweizer Aerzte*, No. 7, 1888, Dr. Theodor Schneider (Basle) recommends camphorated carbolic acid as an "elegant, reliable, and very convenient antiseptic preparation." As is well known, when one part of crystallized carbolic acid and three parts of powdered camphor are shaken up together in a test-tube, a colorless, limpid fluid is produced. This mixture does not possess either the characteristic odor or the rubefacient and caustic properties of carbolic acid, while the antiseptic power of the latter remains intact. When placed on the tongue, the compound causes but very slight burning sensations. It has no effect on polished steel.—*British Med. Journal*.

This preparation would form an elegant solution in which to keep horse brushes.—Ed.

ACID CORROSIVE SUBLIMATE SOLUTION.

Dr. O. Rujwid (Warsaw) has used for the last two years an addition of 2 per cent. hydrochloric acid to 1 to 1000 solutions of bichloride of mercury. This solution is more certain than neutral and alkaline solutions of sublimate, which readily precipitate an albuminate of mercury. It is prepared by dissolving 2 grammes of sublimate in 10 grammes of hydrochloric acid under test, and then mixing with 5 litres of water. The sulphates and carbonates present in water

are decomposed by the acid, and are without action. Other surgeons in Warsaw have used the same solution for some time with good results.—Translated from *Centralblatt für Bacteriologie*, No. 3, 1888.

THE MICROBE OF TETANUS.

The bacillary origin of tetanus is rapidly being placed on a sound basis. In some recent experiments with a certain bacillus, which is credited with this pathogenic power, forty-five guinea-pigs, seventeen rabbits, two lambs and one sheep were inoculated with a cultivation, with the result that twenty-seven of the animals died of well-marked tetanus, twelve suffered from tetanic symptoms, from which they recovered, and ten died from acute systemic infection without tetanic manifestations. Although the investigation bore on the pathology of idiopathic tetanus, it is highly probable that traumatic tetanus is due to the same cause.—*Med. Press and Circular*.

DR. BELL TAYLOR writes in the *British Medical Journal*: M. Pasteur's treatment has already been followed by 136 deaths; the vast majority of the people who have visited him were in no sort of danger, and it does seem a pity to induce such patients to incur the terrible risks inseparable from the hypodermic injection of rabid matter. Dr. Lutaud, chief editor of the *Journal de Médecine de Paris*, says: M. Pasteur does not cure hydrophobia; he gives it, and perhaps he is right.

DR. G. D. SITHERWOOD, Bloomington, Ill., uses lanoline as a menstruum, also glycerine. He prefers the following formula for eucalyptus:

R	Oleum eucalypti.....	℥x
	Glycerine.....	℥j

M. Sig.—Apply locally.

For an atiseptic and prophylactic tooth powder, he adds to an ordinary powder one-half its bulk of acidum boricine.

OHIO STATE DENTAL SOCIETY.—The fourth annual meeting of the Ohio State Dental Society will be held in Cincinnati, October 16, 17 and 18, 1888.

J. R. CALLAHAN, Hillsboro, Ohio, Secretary. JERE. E. ROBINSON, President

BEGINNING with the session of 1888-89, the College of Physicians and Surgeons, New York, following the example of Jefferson Medical College, Philadelphia, will require a three year's course of study from its students.

THE MEDICO-CHIRURGICAL COLLEGE, Philadelphia, also re-establishes its three years' course, which had been lowered last year to two years' actual attendance and one year with preceptor.

A NEW MEDICAL COLLEGE has been incorporated in Brooklyn, known as "The College of Physicians and Surgeons of St. Mary's Hospital of the City of Brooklyn."

THE COST of the last International Medical Congress in Washington was over \$54,000, much exceeding that of any one of the previous three.

Koller, the discoverer of cocaine, has removed from Vienna to New York.

THE Independent Practitioner.

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NOTE.—No paper published or to be published in another journal will be accepted for this department. All papers must be in the hands of the Editor before the first day of the month preceding that in which they are expected to appear. Extra copies will be furnished to each contributor of an accepted original article, and reprints, in pamphlet form, may be had at the cost of the paper, press-work and binding, if ordered when the manuscript is forwarded. The Editor and Publishers are not responsible for the opinions expressed by contributors. The journal is issued promptly, on the first day of each month.

Original Communications.

THE RELATION OF THE TEETH AND PALATE TO VOCALISM.

BY THOMAS FILLERBROWN, M. D., D. M. D., PORTLAND, ME.

Read before the Union Meeting of the Connecticut Valley and Massachusetts Societies, Boston, Mass., July 10, 1888.

The relation of dentists to the oral cavity is such as to demand of them a thorough understanding of all that pertains to its functions, as well as its anatomy and pathology. Vocalization and articulation are among its most important functions, and worthy the thoughtful consideration of this body.

Having had considerable personal experience in vocal culture, favorable and unfavorable, and also in the forming and adjusting of obturators for cleft palate, I have been led to study the subject more or less thoroughly, and I find my conclusions so radically different from the teachings of dental text-books, that I feel constrained to offer them for your consideration.

The action of the soft palate has, perhaps, greater influence upon the tone of the voice than any other organ. I have consulted many treatises on both singing and speaking, and nearly every writer has, according to my observations, entirely misconceived the action of the velum. Drs. Flint and Lennox Brown are the more notable exceptions. It affords me satisfaction to observe that by personal consultation I find that *teachers* of singing and speaking are, in many cases, giving much better instruction than is written in the books.

Few writers, indeed, have made personal examinations on the subject, but have been content to take for granted the general ideas of others. Not a single work on oratory that I have been able to find gives any definite idea at all of the action of the organs of the human vocal apparatus and in them no attempt is made to define, describe or explain the action of the soft palate. Some physiologists have described its action, as observed by them, but in wrongly educated subjects.

Dr. Kingsley says : * “ Pure vocal sounds can be made by the resonance of the buccal cavity alone. Let any other cavity communicate with it, and the purity of the vowel sounds is destroyed. If there be any escape of breath or sound, however small, behind the curtain of the palate, the vowels will be nasalised.”

Dr. Carl Seiler states : † “ The cavities of the nasopharynx and nose are separated from the direct influence of the vibrations of the vocal cords by the adaptation of the soft palate to the pharyngeal wall.”

Dr. Seiler conceives the head cavities to be a reinforcing power, but thinks they are set in vibration through the walls of the palate, and not through an opening behind the velum.

This is entirely at variance with facts, as verified by my own experience and observation. The true office of the soft palate is not to close but to modify the opening into the nares, and thus attune the resonant cavities to the pitch and timbre of the note given by the vocal cords, throat and pharynx. A sound confined to the throat and mouth is harsh, weak, and without penetrating

* Oral Deformities.

† American System of Dentistry, Vol. III.

power; but aided by the reinforcing vibrations of the nasal and head cavities, the voice becomes soft, strong and far-reaching, and agreeable to the ear of the listener.

To understand how the palate or teeth affect vocalism, we must understand how the best tone is produced. This we can get by studying the organs themselves and their action. The organs which give forth the human voice constitute a musical instrument of great range and power. Every truly musical instrument has in it three elements—a power, a vibrator and a resonator. The violin has the bow for a power, the string for a vibrator, and a hollow body with its contained air for a resonator. The French horn has the lungs of the player for a power, the lips for a vibrator, and the gradually enlarging tube, terminating in the flaring bell shape, to produce the quality and resonance.

In all of these instruments, the quality and power of the tone depends upon the presence of these three parts, and their perfection of construction and proper relation as regards each other as to size and position, and upon the perfect use of each part.

A split sounding-board spoils the piano; a "cracked kettle" is the synonym for everything disagreeable; and the indented bell destroys the lovely tone of the French horn.

The human vocal instrument has these three elements, and each element variable according to the will or feeling of the player. This constitutes a modifying power, which gives a variety of quality known in no other instrument, and makes it the wonder and admiration of mankind. To these is added another element—**organs for articulation.**

In this human instrument:

1. The lungs give the power.
2. The vocal cords are the vibrator.
3. The nasal and head cavities are the resonator.
4. The mouth and lips are the articulator.

The modification of these parts, produced by the feelings of the singer or speaker, give qualities of tone expressive of any emotion a person may feel, as pain or pleasure, joy or grief, courage or fear.

The quality and power of resonance is well illustrated by a tuning-fork, which, if set in vibration, can, unaided, be heard but a

little distance, and only faintly; but if rested upon a table or plate of glass, or, better, upon the edge of the bridge of this violin, it will set up a series of vibrations of the same pitch and character, which are distinctly heard throughout this large hall. A column of air, contained in a cylinder or pipe of the size and length to reproduce the note, or a bottle with a neck the right size, will produce the same effect when the vibratory fork is held before the opening; but if the opening be stopped up, the vibrations can be only very imperfectly and faintly reproduced.

The walls and contained air of the head cavities, which consist of the mastoid and ethmoid cells, the antra, vomer, turbinated bones and frontal sinuses, present a vibratory surface of scarcely less than fifty square inches, and contain from twelve to twenty cubic inches of air, and constitute a resonator of wonderful power; but if they be shut off from the vibratory cords by closing of the velum against the posterior wall of the pharynx, their resonating power is lost, and the tone goes out undeveloped. The tuning-fork was not heard, but the vibrations of the resonant violin upon what it rested were loud and prolonged, and filled the hall. The vibrations of the vocal cords alone are insignificant. It is the vibrations of the resonant apparatus of the human instrument which give pleasure to the ear, and are sonorous and far reaching.

The nasal tone so much dreaded by vocal teachers, and the "Yankee voice" is not produced by an open palate, and the vibrations extending to the nasal passages, but by obstruction principally of the outer nasal passages by contraction of the *alæ* of the nose. If the nostrils be contracted by muscular actions or by outward pressure, the nasal twang will be pronounced; but if the nostrils be fully opened a full clear tone is given out. If while giving the prolonged sound of *ng* the exterior opening of the nose be alternately compressed and distended the difference in the sound will be very marked as to nasal quality. The genuine "Yankee tone" seems to be dependent also upon a contraction of the posterior nares and elevation of the dorsum of the tongue; but the pure nasal quality is produced as above described.

That the velum is drawn forward allowing a free passage into the posterior nares during the vowel sounds, I have had proven by observations. Prof. Harrison Allen, of Philadelphia, kindly gave

his attention to the matter and made examinations for the purpose and found this to be the case. Dr. L. E. Kimball, of Portland, also verified the conditions, and Lennox Brown makes the same statement.

Singers cannot obtain the best quality of voice except in this way, and as speaking is only modified singing the same rule holds good for the formal speaker as for the singer. Because the singing voice is so much better understood, I have analyzed its productions to illustrate the formations and delivery of the speaking voice.

Singing is a formal continuous tone unbroken between the words. Speaking is broken between the words and syllables. Singing is confined to some particular pitch and changes from one pitch to another by regular intervals.

Speaking is unrestrained by such limits and varies without relation to pitch or interval. Yet the accomplished speaker uses very largely a definite pitch and musical tone.

The singing and speaking tones are produced by the vocal organs in the same way and in precisely the same form with the same resonance and the same articulation is used.

A great deal is said and written about a "pure tone," but writers do not describe it, and it is meaningless in itself.

We are told to speak and sing natural, for the natural tone is correct. This is also indefinite. What is a natural tone? It is natural for a child to imitate the first sound it hears; it may be the French nasal, the German guttural or the American open tone. In either case the child imitates and for it this becomes the natural tone.

To be natural is the hardest lesson to learn, and it is only the result of severe and prolonged discipline. Untrained naturalness is the perfection of awkwardness.

The involuntary functions of organic life are the only ones naturally performed correctly. Nature's method of circulation, swallowing and breathing can be depended upon, and the initial cry of the infant when ushered into the world like the frog song, which is recognized throughout the house. But unless consolidated in their action by imitation and discipline, their functions will soon be corrupted by false examples.



Fig. 1.

Fig 1 shows the position the palate and tongue should assume while giving the sounds of vowels and diphthongs—*a, e, i, o; Ōo, oi, oy, ou.*

The essential qualities of a tone are now recognised to be softness and resonance, the last making it far-reaching and effective. Power and volume are the product of increased resonance and largeness. Resonance is increased by the more perfect focusing of the vibrations. Largeness is improved by a general expansion of the cavities of the throat, mouth and nose, especially by depression of the tongue. To properly form and deliver a tone all the organs involved should be correctly trained and well used.

Correct breathing is very essential, and this is universally conceded to be the abdominal breathing. The lower part of the thorax is enlarged laterally, and the abdomen is enlarged both laterally and anteriorly by the depression of the diaphragm.

The shoulders should *never* be raised a particle, but should remain as fixed as were Demosthenes under the points of the swords hung above him.

Expel the breath by contraction of the abdominal muscles; and in proportion as they are trained and strengthened will the possible force and intensity of the tone increase. The weakness of many singers is the result of weak breathing. Observe a sleeping infant; it will afford a perfect example of abdominal breathing, and no one could have a suspicion of sex from any difference in the function. In my judgment all the peculiarities of female breathing are the result of customs practiced in after life.

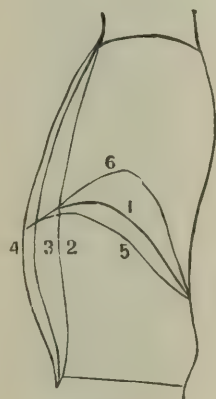


Fig. 2.

Fig. 2 is the profile of an accomplished vocalist and shows correct breathing. It is worthy of notice how much more the breathing capacity can be lessened than increased from the state of rest.

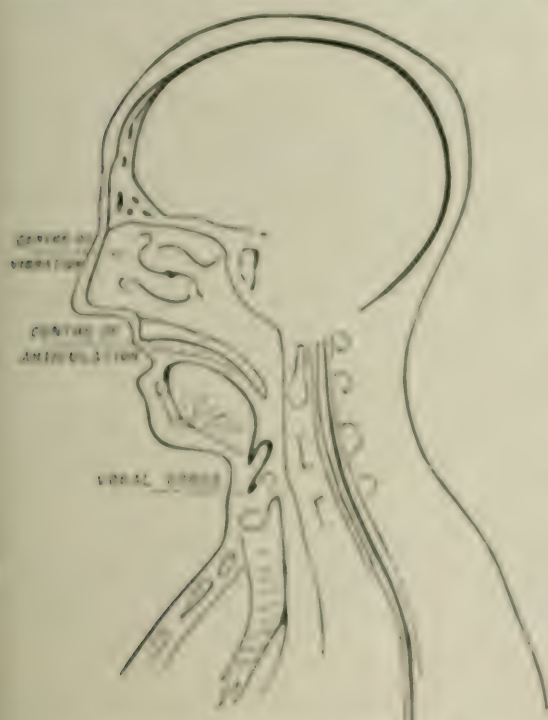
1	Position of diaphragm at rest.
5	" " " during full inspiration.
6	" " " " " expiration.
3	" " Chest and abdomen at rest.
4	" " " " " full inspiration.
2	" " " " " " expiration.

The larynx should rest in the position it takes during a yawning inspiration; any bobbing around or up and down is detrimental to the quality of the tone and injurious to the organ.

The head should be inclined a little forward, the chin down, and the under jaw drawn back, the tongue should lie as low as possible in the mouth, and the mouth and pharynx made large.

This will throw the velum forward and open a free passage into the nares.

The principal centre of vibrations is the middle of the nose. The tone should seem to be made in the nose and head, and the vibrations can be plainly felt by placing the finger lightly on the thin bones of the nose or upon the top of the head.



POSITION OF HEAD AND CHIN.

All good singers produce their upper notes in this way; but many take the lower notes differently. I am quite fully convinced that the more nearly the voice is focused, as here described on low tones as well as high, the better the tone will be, and only in this way can the best results of which a voice is capable be obtained.

The center of articulation is apparently through the neck of the upper tooth and lip.

If these rules are observed the voice will not be disturbed by articulation, and the speech will seem to be entirely independent of the tone as the

articulation of the solo singer is independent of the organ tone which surrounds her, though she sets all the air in vibration by speaking the notes.

Many theories are held as to the registers of the voice.

Some claim one, some three, others six. While one at least finds as many registers as there are notes in the compass of the voice.

Register means as I understand it a condition of the vocal organs as to position, focus or tension, of one or more parts, which changes when passing from one register to another.

My own studies lead me to the belief there is but one register, or rather no such thing, further than it applies to the compass of the voice. Such as head, middle and chest registers, are artificial divisions made by education, and to my mind a false education. Of one thing I feel sure, that if a singer or speaker will focus and deliver the tones throughout the compass of the voice, as described in this paper the questions of register need never be raised, and the difficulties of "blending the registers" will never be found.

Vocal organs used as thus described, will scarcely feel fatigue, and hoarseness will be to them almost unknown, and "minister's sore throat" an unheard of trouble.

To obtain the best results each organ of the voice must be not only well trained, but well formed in all of its parts; hence, if the teeth are mal-formed, irregular, or there are spaces between the anterior teeth, or they suffer other mal-arrangement, the quality of the voice will be disagreeably affected.

A prominent upper or under jaw or the absence of one or more teeth render vocalizations and articulations more or less imperfect and peculiar.

The palate must also be perfect, and harmony of proportions and relations must exist between all parts of the vocal organs. Artificial substitutes for lost or absent parts, whether they be teeth or palate, can never fully perform the functions of the natural members. The expectations of the patient and their friends may be moderated so far as to be fulfilled; but to the educated ear, the imperfection will be apparent.

The soft palate moves in all directions, not only forward and backward, but upward and downward; it also shortens and lengthens. As yet no obturator has been constructed that can

compass more than the two first movements, consequently it cannot perfectly supply the absent part.

Dr. Kingsley's flat soft rubber velum more nearly fulfills the conditions required than any other yet invented, and if the material was not so perishable, it would be all that could be reasonably desired. The ball obturator hung in the throat is philosophical and un-physiological. It fills up the passage to the nares and obstructs the entrance to the resonator of the voice. Thus doing precisely what it is desirable to educate the natural velum not to do.

Hard rubber is cleanly and durable, and is the best material for this purpose.

An obturator which has served me best is one made of hard rubber nearly flat, curved to correspond to the form of the natural velum long enough to reach back against the anterior border of the atlas and attached to a plate by a hinge or otherwise so as to move freely back and forth with the edges rounded, and so formed that the muscles of the split velum will just close forward of it and carry it back against the posterior wall of the pharynx during swallowing or speaking. The size and form of the velum at the upper portion where the hinge is attached, should just fit the notch of the cleft so the parts will just close around it tight when they contract. Such an instrument serves very nearly the purpose of the soft rubber velum, and is in harmony with the philosophy of voice production as to-day demonstrated.

The training of the larynx must be negative. The position is easily determined by a yawning inhalation. The effort of the mind must be to leave it unrestrained by the action of the supporting and surrounding muscles. The pitch is determined by the inferior muscles controlling the vocal cords. Contraction of the muscles exterior to the larynx is one great cause of the throaty tone so common and so injurious.

Any exercise, as lifting, rowing or dumbbells, which requires a fixation of the breath, will strengthen the abdominal and thoracic muscles and increase the breathing power. Full, deep and prolonged inspiration will increase the breathing capacity. Slow inspiration and expiration will give control of the muscles, and enable one to use at will the power and capacity required.

Many other points crowd upon our attention in connection with this, but the limits of the hour will not permit any attempt to discuss them at the present time.

ROOT CANALS CONSIDERED IN RELATION TO FILLING AND PREPARATION FOR ARTIFICIAL SUBSTITUTES.

BY LOUIS OTTOFY, CHICAGO, ILL.

READ BEFORE THE NEW JERSEY STATE DENTAL SOCIETY
AT ITS
EIGHTEENTH ANNUAL SESSION HELD IN ASBURY PARK, THURSDAY
EVENING, JULY 19, 1888.

I desire to call your attention to a few points relative to the preparation of root canals for filling or for the attachment of artificial crowns—points of more or less importance, though often under-estimated in dental practice. We are painfully aware that not only the less positive scientific branches, which enter into the study of dentistry, are enshrouded in mist and veiled with a certain amount of indefiniteness and unreliability; but we find that even those branches which are known as the foundation on which the others have been built, are very crude, uncertain, and in many instances entirely false. This is true in some measure of dental anatomy. Many errors in relation to the anatomy of the teeth have crept into early editions on anatomy, or have been culled from works on general anatomy, written or revised by eminent scholars in general medical sciences. The statements have been accepted as facts, and published and republished until these fallacies have become well-grounded opinions of many members of the profession.

It is not so deplorable with those subjects which, instead of being misinterpreted by dental anatomists, have been wholly or partially ignored; because, at least, if the student is not enlightened, he is not misled; but remains in a position to receive correct impressions. Dental anatomists have not given as much attention to the consideration of root canals as their present importance demands. To the dental practitioner of to-day the shape, size and probable length and location of a root canal, and the relative size of the canal to the root, is of the utmost importance—of more importance than at any time in the past. To the dentist of the future much will be clear and concise, which to the busy practitioner of the past and of to-day has been a source of annoyance,

and frequently the cause of failure. For the attachment of the wooden peg pivot of the earlier times, whose application was restricted usually to straight-rooted anterior teeth, or for the introduction of fillings into the cavities of pulpless teeth, leaving the roots unfilled (a vent-hole or an abscess affording exit for the putrescent contents of the canal), a limited knowledge as to the root itself, or the channel within it, was sufficient. For the varied operations of root filling and crowns, a better knowledge of the form of root canals is essential, and a thorough understanding of dental anatomy is almost indispensable to the successful practice of dentistry.

The information dental anatomies contain in regard to root canals is generally embodied in the very incomprehensive general expression: "That the pulp chamber and root canal correspond with the general outline of the tooth." In the main this is true, and the perfect knowledge of the anatomy of the tooth seems primarily indispensable. It certainly is essential, though the shape of a root does not always indicate the size, direction or possible bifurcation of its root canals.

That much is to be said in regard to the canals of the upper central incisors; these teeth have perhaps the most favorably-shaped roots of any, and it must be gross carelessness indeed when any manipulation within the pulp-chambers or canals of these teeth do not result favorably. The compression of the roots of these teeth, as so often met with in the lateral incisor, is so rare, that weakening of a frail root while preparing it for the reception of the pivot, or when removing decayed portions therefrom, should never be the result. The form of the root of the lateral incisor is often deceptive; relatively speaking, the root is correspondingly not so wide from the mesial to the distal surface as the root of the central incisor. The crown of the lateral incisor is relatively wider than the crown of the central incisor, and hence there is more facility to weaken the root while enlarging the canal; frequently, also, the root of this tooth is grooved on its flattened side to such an extent that much care must be exercised not to remove too much bony substance so as to possibly perforate or weaken the root.

The roots of cuspids require perhaps only the same amount of care bestowed on the central incisors. Their tendency to be flat-

tened laterally should be remembered during the preparation of their canals for the reception of the pivots; neither must one forget the tendency of their roots to bifurcate, as evinced by grooves on their mesial and distal surfaces, and by the frequent division of their canals, which, however, generally unite before reaching the apex of the root.

The form of the root of the first upper bicuspid varies perhaps more frequently than that of any other tooth, about thirty per cent. being bifurcated, and of the remainder but few have a single canal the entire length of the root; most of them have either two partly or entirely distinct canals joining near the apex, and having only one common outlet; or a single-rooted bicuspid may be provided with two canals, each of which has a separate foramen.

The second bicuspid seldom varies, is generally single-fanged, having a single channel, and therefore in its relation to root filling and artificial crown attachment offers no impediments.

In regarding the lower teeth, it should be remembered that the roots of the incisors and cuspids are generally flattened. While the roots are seldom bifurcated, the canals often are bifurcated a part of the distance of their length; but they generally unite and have a common foramen. This is true oftener of the cuspids than of the incisors.

The roots of the lower bicuspid, like those of the upper second bicuspid, offer no impediments to the ready attachment of crowns or the filling of their channels.

It is seldom necessary to introduce posts into the roots of molars, and hence their consideration in that relation is dispensed with.

As a rule the drilling, reaming or any other method of enlarging root canals, is pernicious practice and should be almost entirely abandoned. When a proper entrance to the pulp chamber has been secured, before any effort has been made to enter the root canals, the reaming or enlarging of the canal will not be found necessary. Opening into a pulp-chamber and securing an entrance into a root canal should always be done under perfect antiseptic precautions; for this purpose flooding the cavity with one to two hundred solution of bichloride of mercury has been recommended and found very efficacious. The objections to its use in this way are: its property

to corrode the broaches used, thus rapidly destroying instruments, which should always be delicate; and its other property—said to be very marked—of coagulating albumen. Recently I have followed some interesting experiments conducted by Dr. G. V. Black regarding the antiseptic property of essential oils, and observing the property to be possessed in an extraordinary degree by the oil of cassia, which is very diffusible, I have been led to employ it for this purpose with very satisfactory results. In filling the roots of the six anterior upper teeth, difficulties are seldom encountered, except from the occasional small size of the canal in the lateral incisor, which can be readily penetrated by a fine broach, if no foreign substance has been forced into it.

The rule, that over-hanging ledges should be cut away, is inflexible when applied to all the teeth of the mouth, and it may be especially emphasized when the first upper bicuspids are in question; in the treatment of these teeth easy access is invariably necessary. The use of two broaches is good practice; introduce into the canal, which has been found, a large broach (as large a one that can be inserted), and while leaving it there, endeavor to find another canal by means of a fine, stiff, oiled broach.

The upper first and second molars are often the source of much annoyance, because their canals, especially the posterior buccal, are sometimes very difficult to find; frequently the anterior buccal canals are also difficult of approach. It is presumed that free and easy access has been secured. In extreme cases, when the canal cannot be found (generally due to imperfect light), it is best to arrange for a second sitting; if in the meanwhile some digestible oil, eucalyptol, for instance, has been sealed into the cavity, it is astonishing how readily a canal is found, whose location it was impossible to determine at the previous sitting. From observing the locality in which many drill, bur or cut in looking for the entrance to the posterior buccal root canal, I am led to believe that either our knowledge of dental anatomy is meagre or else we are under the impression that the canals originate from the pulp chamber very much like the legs of an inverted tripod, from the bottom of the seat, in an exact triangle, and hence the opening is searched for too near the posterior and buccal portion of the tooth. In making cross-sections of the molar teeth at the point of bifurcation of

the canals, a triangle is never found; on the contrary the tendency is toward a straight line between the palatine and anterior buccal roots as shown in Fig. 1 (root canals of upper first molar), is most often met with.



FIG. 1



FIG. 2



FIG. 3



FIG. 4

The canal will generally be found slightly back of a straight line, between these two and a little nearer to the anterior buccal than the palatine. Fig. 2, which shows the usual entrance to the root canals of upper molars, is a typical case to illustrate this point.

In filling the roots of any of the lower anterior six teeth, their tendency to bifurcate should be remembered. The use of two broaches is a good practice; one broach will often not readily pass to the apex, but a finer one sometimes follows the first broach at the opening of the tooth, passing into the bifurcated portion of the root, then entering the main channel, and passes beyond the first broach to the apex of the root. This is also often the case with the upper first bicuspid.

In filling the roots of the lower bicuspid, their extreme length should be remembered; aside from that, the canals present nothing unusual, are readily accessible, and easily filled.

The manner of treating of the lower first molar, and the position and form of the root canals, is perhaps less perfectly understood than that of any other tooth. It is generally described as a two-rooted tooth. Remembering that the pulp-chamber and root canals have the general outline of the tooth, the supposition that there are but two root canals is very natural. However, we do oftener find three root canals than two. The canal of the posterior root is the most accessible, no matter where the entrance to the cavity, or where the location of the cavity itself is; while ready access to the anterior canals even in badly decayed teeth must generally be obtained by the dentist, if by no other labor, at least by the cutting away of some overhanging ledge. It will then be found that whenever the canal is bifurcated the broach will

pass most readily into the anterior buccal root canal, and often the existence of an anterior lingual canal is entirely overlooked. Using three broaches is a good way to determine the location and number of the canals.

Fig. 3 illustrates a cross section of the roots of a lower molar, which is not fully developed, and Fig. 4 the tooth as we usually find it. Generally a broach cannot enter at *b*, and if it has entered a canal at *a*, the other one, marked *c*, will often remain unfilled. This may not be of much consequence when the canals have one common foramen, or when the broach through one of the canals passes to that foramen; but when separate foramina exist—as I have seen them—or when the broach enters the smaller of the two canals, and does not penetrate to the apex, imperfect sealing of it is almost inevitable. In the second molars we do not find this condition, and when access has been secured the filling of the root canals is not fraught with many unfavorable possibilities.

The roots of the third molars above and below are less often treated and filled; but when this is done, the necessary manipulation approximates nearest to that required for the second molars.

The posts of pivot teeth are entirely too large, especially those of the Logan crown; on paper these posts look very well indeed, but if the root is to be cut away sufficiently to accommodate them, there will be either nothing left of it, or at least it will be weakened to a dangerous extent.

In attaching porcelain crowns to the roots of any of the six anterior teeth, whether with or without a band, no unusual difficulties are encountered; but when the first upper bicuspid is to be pivoted, the Dutch biscuit-shaped constriction of the root should be remembered, and also the fact borne in mind that a post can be permitted to extend only for a short distance into the root. In crowning the lower teeth, when using posts, the flattened shape of the six anterior teeth must be remembered.

For the molars above or below all-gold caps are better suited, and the use of posts can generally be dispensed with.

BENEFITS—DENTAL AND OTHERWISE.

BY C. C. BARKER, MERIDEN, CONN.

READ BEFORE THE CONNECTICUT VALLEY AND MASSACHUSETTS DENTAL SOCIETIES, BOSTON JULY 10, 1888.

The dental practitioners, who in this year of grace, 1888, fulfill the duties of his chosen specialty, has at hand many advantages which come to him like a blessing, and deserve the name of *benefits*—benefits resultant from the efforts, investigations and labors of others—pioneers, predecessors and co-laborers, which demand and deserve our recognition and appreciation.

You who have noticed the derivation of the term anatomy, (*ana*, “up,” and *temnein*, “to cut”) will remember that it originally signified a cutting; a “dissection of organized bodies so as to expose the structure, situation and use of the various parts.”

If we accept and insist upon this primal sense, then we—dentists—are most certainly and practically *anatomists*; for our life-work, day by day, week by week, month by month, and year by year, is a cutting—a dissection—the everlasting cutting of the dental and oral tissues.

But the term in accordance with modern usage “has been appropriated,” says Dunglison, “to the study and knowledge of the number, shape, situation, structure and connection, in a word, of all the apparent properties of organized bodies.”

Very properly and wisely, those in charge of our dental schools have made anatomy and physiology fundamentals in the curriculum.

And it is not easy to overestimate the importance of these studies as foundations upon which to base an intelligent and successful practice in our specialty. Modern dentistry, with its wonderful achievements and blessings, is thus based; and the benefits which the world has received at its hand, doubtless began with, and are co-incident with the special study of the dental organs.

With the first crude knowledge came the idea and commencement of efforts at conservation; and the successes gained, and benefits attained since that time, run in almost parallel line with the advance of knowledge in this regard.

I considered these facts as axiomatic and self-apparent.

A knowledge of structure and organization, or anatomy, is necessary in order that we understand *function* and vital phenomena, which we call physiology.

We must recognize true physiological action that we may properly distinguish the expression of disease, perverted action, and which latter we call pathology.

Pathological perception is required that we may appropriately treat the diseased condition either for its removal or alleviation; the treatment which we technically denominate as *therapeutics*.

I make this simple statement of sequence to more plainly emphasize the fact already insisted upon that our dental knowledge finds its true foundation in anatomy and physiology.

I cannot attempt to elaborate or to enumerate in any detailed manner the benefits derived since the birth of this knowledge. I shall only aim to speak suggestively in a general way, and later on of some specific points of more definite interest to ourselves as practitioners.

Dental knowledge, like that in many another department, is of comparatively recent origin.

Following the discovery of enamel and its functions came the idea of filling, or "stopping" a tooth, as the operation was then called.

It was so like stopping a leak—The very term shows that the thing was done with some philosophical sense.

I need not trace accurately the history through all the bitter experience during which it became plain that a filling cannot with impunity impinge upon or interfere with the function of the pulp, etc., etc.

It is all a matter of intellectual development, and benefits accruing therefrom; to which each one of you can give special testimony.

How great the advance since that first dawning light in knowledge and in practice up to the present. When now, through a recognition of the vitality of the cementum, and the almost vicious action of the periodontal membrane, many an almost depopulated mouth can be rehabilitated with a worthy denture, rooted and grounded upon nature's own foundation, and many a man which had hitherto dwelt in great tribulation happily wears a golden crown.

Is the alleviation and cure of dental irritation, and the prolongation of human life in comfortable and happy circumstances a benefit?

Is it anything to preserve or supply to man his masticatory apparatus, whereby the nutritive functions continue unimpaired, and "by reason of strength" man attains unto his four score years or more?

These are the blessings which modern dentistry confers upon human kind, everywhere pertinent and grand.

And right here, in passing, I wish personally to express my humble acknowledgments to the pioneers and workers of the past and present, through whose devoted and toilsome efforts the present accretion of knowledge has been attained.

We dentists—whether we are conscious of it or not—are enjoying the fruit of their labors. It is a question—not altogether out of order—whether we properly sense the debt of gratitude we owe. May I not suggest that if it has not been already done, these dental societies of New England should lose no time in placing themselves on record in acknowledgment of the service rendered to our specialty by the co-laborers of the past and present.

Their efforts, however humble some may consider them, have been stepping-stones and vantage ground for farther progress. Do you speak slightly of some of their methods as crude and untenable? So will some of those who are to come speak of us to-morrow. Even their blunders confer benefits upon us, as ours certainly will upon the new generation, provided they have wisdom enough to profit by our experience.

It is not many years, really, since dentists began practically to magnify their calling; and the results have proved that those structures upon which we are called to expend our energies and skill will bear magnifying. The greatest advance yet made in knowledge of the dental tissues has been wrought by the aid of the microscope.

There is a little band of skilled workers in our ranks. All honor to them for their patience, assiduity and untiring devotion. They have done us great service. Not all of us are microscopists; indeed, only a few are.

It requires constitutional fitness to use the binocular well; and time and opportunity, and the very best eyesight, aided by a

trustworthy objective. These things we cannot all furnish. One essential element of constitutional fitness, I apprehend to be a calm and accurate judgment of form, unswayed by exuberance of imagination.

You know one man, looking overhead in the night, discerns fantastic shapes in the starry heavens; while his companion at his side, equally intelligent, sees nothing of the sort. Some claim to often hear whisperings from the angels; some claim frequent temptations from the devil; while others still never hear anything from either angel or devil.

Imagination creates appearances, and gives more color to them than the rainbow itself can furnish.

The eye, without the assistance of a powerful lens, fails to discern the complex structure of the teeth, a structure which the microscope has proven to be *not generic*.

By its means the startling discovery was made that the teeth are developed in the mucous membrane, and are not, in proper reality, members of the bony skeleton; but, instead, parts of the "outer or dermal system," and of similar origin as the nails and hair.

The principles of dental embryology and histology are doubtless well and correctly established in the main, and are clearly and beautifully presented to us in the writings and illustrations given by Dr. Sudduth of Philadelphia, Dr. Andrews of Cambridge—our honored President, Dr. Stowell of Ann Arbor, Drs. Heiman, Abbott and Bedecker of New York, and others.

Although differing somewhat in detail, with here and there a "missing link"—proof that some at least, if not all of the brethren, still "see through a glass darkly." Yet, notwithstanding this, the histological character, nature and function of the tissue elements composing the dental structures has been so well apprehended and revealed as to greatly aid our conception of proper hygienic and therapeutic treatment; and we and our patients have been correspondingly benefited.

But too much must not be expected from the microscope.

There are those who talk as if they believed that most problems will yet be solved by the medium of the all-powerful lens.

I do not for a moment believe it.

Proof that this *cannot be* is very readily furnished.

For instance, protoplasm is the unit from which all our beginnings proceed. It is what the etymology of its name signifies—*protos*—first, and *plasso*—to form—that is—the first form of living matter.

We know that the life of every animal organism begins in the ovarian egg, which is declared by embryologists to be “a minute globule of protoplasm.” They also state emphatically that “the undeveloped ovarian egg, immediately after its fertilization, is uniform in appearance throughout the animal kingdom, the human ovum at this stage corresponding in structure to those which stand at the very foot of the zoological scale.”

Now, who cannot fail to realize, with a moment's reflection, that in this immense ovarian group, from which over one hundred thousand distinct species of animal life are evolved, that each one of those eggs, which, remember, as nearly as can be discerned with the most powerful lens, are only “minute globules of protoplasm,” and “uniform in appearance.” Yet each one of them represents a distinct species, differing from each other in almost infinite variations.

This one will be a pig; that, an elephant; this, a frog; that, a man.

It's a long catalogue—over 100,000 names—and all varying to an indescribable degree.

But here in the beginning all are alike, so far as human ability employing every aid can distinguish, and we call them protoplasm, which conveys to us the sense of homogeneousness, likeness and simplicity of nature.

But their subsequent varying development proves that this likeness in the early stage is a *seeming*, rather than real; for who can doubt that wrapped up in these protoplasmic globules, we have the distinct plan, the *prevision* of the creature that is to be. So what we call *proto*—first—is not first after all.

No. 1 lies further back.

There is something resident in these little granules which escapes our keenest visual penetration, and eludes one test of our finest chemistry. So you see on two sides, both the Physicist and the Chemist reach impassible barriers in their attempts at ultimate analysis.

I have spoken thus for the variations between species; allow me to call your thoughts to the differences which distinguish members of a single group from each other. We will take our own group—the human mammal—man.

How varied are the combinations of organs, as in the teeth—the differences in size, form, weight, color, texture, relative development of parts; in short, all those distinctive features which give peculiarity and individuality to every single member of the human family, all these marks reside in that original bit of protoplasm.

And this is not all; neither can I attempt to tell all; but that which determines the mental development, the grade and character of the intellect, the temperament, diathesis and every idiosyncrasy to which humanity is heir, is there wrapped up in that little cell.

And of course we shall not fail to remember that the potentiality and the detail of plan which shall weave the teeth themselves, according to a definite character of form and texture, and attitude, is resident also in this marvellous atom, which after all is no atom at all.

Do I believe in heredity?

Most certainly, and not in a loose, general way, but in the finest detail.

I suppose no argument is necessary here to establish the foundation of this truth.

A recent writer correctly states that "No fact is more pregnant with awful meaning than the facts of the inheritance of disease.

It meets the physician on his daily rounds, paralyzing his art and filling him with sadness.

The legend of the ancient Greeks pictured the malignant Furies pursuing families from generation to generation and rendering them desolate.

The furies still ply their work of terror and death; but we have stripped them of the garb which superstition threw around them, and they now appear to our eyes in the more intelligible but not less awful form of hereditary disease.

Modern science, which has cast illumination into so many dark corners of nature, has shed a new and still more lurid light on the words of the Hebrew scripture: "The sin of the father shall be visited upon the children unto the third and fourth generation."

Sir Henry Holland says that "No organ or texture of the body is exempt from the chance of being the subject of hereditary disease." Our own experience as dentists furnishes us daily proof that the teeth must be included in the category.

And when I say this, I mean to go so far as to state that every tooth in the human mouth has an individuality of form and size, and color and texture of position and articulation which in the larger degree has been determined by the parentage.

Positive proofs of this are attainable wherever we have the opportunity to carefully compare the conformation of the dental arches of parents and their children, and notice how the teeth of the younger generation seem in so many instances the copy of those in the mouths of the older, which stand there like original types. A most striking instance has occurred in my own practice within the last year.

These marked examples are only the more striking and apparent instances of that law of heredity which determines the character of the dental structures.

Every practitioner within even limited experience, quickly discovers that there are many grades of tooth texture—from that of almost chalky softness to that of nearly flint-like hardness—with corresponding capacity and endurance.

Of these variations, the microscope has as yet failed to give us anything like an intelligible or recognized classification, or to emphasize to us what we may consider as the ideal tooth.

But the dental surgeon, as he cuts with the excavator, burr, or drill, is immediately aware of these varieties; not always through the medium of sight, but by virtue of the sense of feeling, of touch, and as we well know by means of this recognition which comes to us primally through the touch—the feel. Sight itself becomes educated to that degree that unaided by any microscope, it can often identify these varying tooth characters without the contact of touch.

There are some teeth so exceedingly frail in point of structure, that the finest operations within the capacity of dental skill will fail to save; and the hardest thing perhaps for patients to understand is this variation in tooth character and structure.

Until they are able to discern this more fully, so long will they fail to distinguish carefully between good operations and poor.

Reports of Society Meetings.

THE CONNECTICUT VALLEY AND MASSACHUSETTS DENTAL SOCIETY.

UNION MEETING, JULY, 1888.

REPORTED FOR THE "INDEPENDENT PRACTITIONER" BY ILL. CL.
RAYMONDSON, D. D. S.

(Continued.)

Discussion on Dr. Allan's paper on "The Germ Theory of Dental Caries," was opened by Dr. W. X. Sudduth, Philadelphia.

Owing to the lateness of the hour I shall make my remarks as brief as possible. Dr. Allan has presented a most excellent paper upon the subject and I have never seen the exhibit you have witnessed to-night excelled in this country. The photomicrographs are the finest it has ever been my pleasure to look at. Dr. Andrews has fairly outdone himself in their preparation. The value of such demonstrations as compared with drawings cannot be considered; you have seen thrown on the screen the shadows of the bacilli found in the dental tubuli. They are shadows of realities which if they did not exist could not have been photographed. The camera never invents or draws on its imagination. It tells the truth and deals only with facts. No chimera can find lodgment in the camera obscura. However strongly the connection of these micro-organisms with the etiology of decay may be denied, no man can go away from this hall to-night and say that their presence in the dentinal tubuli has not been clearly demonstrated. I cannot explain to myself how it is that the profession at large—medical and dental—has been so averse to accepting the "germ theory." It is true that its advocates promulgated theories that were radically opposed to those which have held sway for many years. The opposition may, perhaps, have been due to this fact. It has been steadily gaining ground, however, until today it is firmly rooted in all our literature, medical and dental. The criticisms hurled against it have only tended to establish it all the more firmly. One significant fact might be mentioned in this connection, and that is that all the young men who have come into the profession within the last decade have accepted it with but very few exceptions. Those who hold out the

most strenuously against it are the older members of the profession who were educated under the old regime and who have found it difficult to shade off the shackles of prejudice, and accept the only theory that has been advanced to explain the heretofore unexplainable in medicine. The "Germ Theory of disease" has done more to remove the "Ifs" from out our pathway, and make an exact science out of medicine than all the other work that has been done put together. Dr. Miller's theory of the formation of cavities by the action of a digestive ferment upon the basis substance of dentine has been the only theory ever advanced that explains the formation of cavities. At one blow he swept away all the speculations of past years regarding the etiology of decay. There is a vast difference between speculation and theory. A theory must have some basis in fact while speculation may soar aloft untrammelled by sordid reality.

I would say more, were it not for the lateness of the hour. I hope, however, that the subject will be called up in the morning.

MORNING SESSION, JULY 12, 1888.

Discussion Continued.

Dr. W. H. Atkinson, New York City—I have nothing but commendation to offer for Dr. Allen's paper. It was clean-cut and straightforward, but he said it was a collection of what he had read on the subject more than what he had done. Other than the making of specimens and his interpretations, the paper is exactly a reversed truth. He said that the secondary dentine that so uniformly follows the insertion of fillings in decayed cavities in the teeth settled the question as to the non-inflammatory process of the reparative activity that forms secondary dentine. Had he known the influences operating to produce it he would have seen it was the exact initiative of the process, which, when arrested just before it becomes pronounced inflammation, becomes "reparative" inflammation. The difference is that it has not arrived at the true inflammation.

He also said he had the greatest pleasure in endorsing Dr. W. B. Miller's statement regarding the identity of artificial decay to that produced in the mouth according to the natural process. There is not one of those cases that cannot be discovered in an in-

stant as to which was natural and which artificial. In every case that was artificial the micro-organisms followed the line of the tubules without striking into the consolidated inter-tubular substance that we call the basis substance of the dentine.

Dr. M. L. Rhein, New York City—I would like to ask your interpretation of the pipe-stem series.

Dr. Atkinson—It strikes me that we do not know the value of their formation. It has not been proven that microbes get down the pipe-stems. What is it that acts against the lime salts? Let him that says it is an acid prove it. You saw that beautiful specimen of a lateral incisor, cut thirty years ago by Dr. G. S. Allen, in my laboratory in Cleveland, O. Have we got ahead of the instruction that is in that slide yet? Not by a good deal, and we use it to-day to show that what has been said within the last ten years is not so new as it would appear.

I have shown you clinically in years past cases of alveolar abscesses that were pumped full with wood croosote, so that the fistulous opening was whitened, and the roots and crowns filled, and they remain sound until to-day. One case in particular I remember of a man affected twenty-four years with a discharging fistula—left central incisor. In four weeks, with two or three applications, it was cured. Even if we find difficulty in knowing what these microbes are, we do know how to squelch them.

Prof. Mayr's paper was almost perfect. It did not have a single ambiguity, and was so luminous that all we have to do is to take our little torches and light them at the ignition of his statements to make us see what there is in stony radiance before us. The endayeric poison in ptomaines, he said, must have the light of ammonia. If we were to comprehend the chemistry of it, it would so occupy us that we would not do anything but study chemistry all the remainder of our lives.

Dr. C. N. Pierce, Philadelphia—Let me thank you, Mr. Chairman, for the opportunity of expressing my gratification in listening to the two papers read, by Prof. Mayr and Dr. Allen. I came to Boston almost exclusively to hear them.

Dr. Sudduth, in his remarks, said that he could not see why people were so slow in accepting the "germ theory of disease." I want to say just one word, and speak of an instance or two

among many that I have recognized as reasons for the slowness with which the theory has been accepted. In a scientific body in Philadelphia, a gentleman came before the association with a paper on a poisonous substance supposed to be secreted by the kidneys. The paper was well illustrated; but upon investigation, it was found that the article that had been examined microscopically was not what it was thought to be at all. The servant had thrown out the original urine, and to cover up his carelessness had substituted something else. In another instance an elaborate paper was written on the subject of a new vomit—low forms of life. A subsequent examination which was directed showed that the patient's bed was close to a window near which grew an ivy vine, and what the physician had found in the vomit in large quantities was the stellate particles of the ivy leaf. The patient had chewed these, and they made him sick. This liability to error which is known to exist is one of the reasons why people have been slow in accepting the germ theory of disease.

I have one criticism to offer on the delightful paper and exhibition made by Dr. Allen last evening. In his desire to impress upon the audience the influence of microbes or low forms of life in the production of dental caries, he was disposed to ignore what we term predisposing causes, or an influence—constitutional or local—that may prevent or modify the progress of the disease. I do not think it was intentional; but it might appear so. He showed us a beautiful specimen of a lateral incisor, upon the palatine or lingual surface of which was a deep fissure, running down from the basilar ridge. Such a fissure in the mouth of a young miss about to graduate from school, striving for prizes, etc., with a stimulated nervous system, would go to the pulp in less than three months. Suppose that fissure now in a tooth in the mouth of a mature individual, with good nutrition and functions, in which case it might remain there without material change for three years, and not endanger the pulp chamber; so that nutrition and function have modifying influences, and must always be taken into account in the progress of dental caries.

Again, suppose it in the mouth of a mother or a person about to become a mother, where every energy is taken in building up the child—we have the same result: decay extending into the pulp

in three months; where, in the normal condition, when all the energies are properly protected and the system is receiving sufficient nutrition, it may remain there for years without further progress.

The beautiful illustration of the transverse sections of the tubuli showed that in certain tubuli we had masses of a low form of life making great destruction; while in others none were present. They do not attack so much the more indestructible, but seek the weakest portions; and that is why they enter the tubuli. They go there because there is organic matter that offers them a pabulum. Where we have no pabulum, we have no life. Life is always present where there is anything to sustain it.

Another word regarding Dr. Atkinson's remarks. I value him as a teacher, and know him to be possessed of many commendable attainments; but he made a remark this morning that is a little unjust. He referred to the illustration shown last night, where the bacilli were shown in the tubules, and asked, How do we know they are low forms of life? We hardly think Drs. Allen, Seckbach and Andrews would come before this body or any other and state that in those tubuli we had low organisms, unless they were fully convinced of their identity.

When I came to the city on Tuesday morning, almost the first gentlemen I met said, "Well, Pierson, have you been converted yet?" alluding to the inference that I was not a believer in the germ theory of dental caries. I am a firm believer in the presence of low forms of life, whereby dental caries exists; and I know, from the statements of Dr. Allen, Miller and others, that artificial caries has been induced by the presence of these low forms of life. I am a firm believer in the fact that dental caries cannot progress without these low forms of life; but what I desire to say is this: I want it recognized that there is a power that may anticipate or even overcome them; and that where you have an influence brought to bear, either through systemic or local conditions, functional or otherwise, they may be overcome; may have their action prevented; and that their influence is greater where there is a deficiency in recuperative force. Then it is that those organisms have the power to do the greatest mischief.

Dr. M. L. Rhein—I was very much interested in the admirable illustrations which we all witnessed last night, and I feel my-

self very much in the position of Dr. Pierce. I believe that the germs play an important part in the etiology of dental caries, but not to the extent that the author of last night's paper wants us to believe. As I understood him, he places the entire cause of caries upon micro-organisms, and allows nothing else to enter into the consideration. This is the antagonizing point that Dr. Pierce has taken up, and it is that which met me at every stage of the illustration last night. All of the illustrations tended to convince me that there were other points entering into the cause of the caries.

I want to protest against the point laid down by Dr. Allen that we know the cause of dental caries, and that the "Germ Theory" explains everything. There is to my mind a great deal more to be explained than what was explained last evening.

There was one more point in the paper that I oppose, and that is the statement that the enamel is non-vascular. The illustrations presented last evening distinctly showed that vascular fibrils penetrate the enamel. We know that the enamel bears the same relation to the dentine, in one sense, as the epithelial layer of skin does to the true derm. That there is a constant waste and repair in the epithelial layer of the skin is not questioned, and yet we find no evident traces of vascularity; but that does not prove that directly underneath there is not vascular tissue. In some teeth I have seen under the microscope very great vascularity under the enamel.

Dr. W. X. Sudduth—If any one has a right to speak authoritatively in regard to this matter, it is surely those who have worked experimentally on the subject, who have actually cultivated and studied these germs, and who for years have given it their attention. There are several men in the profession who have done this. They desire to go hand in hand with men of clinical experience. Whenever I find that my scientific work does not agree with the daily experience of those who work at the chair, then I immediately doubt my own conclusions and not those of the clinician. If we cannot practically demonstrate our theories to you, and harmonize them with your experience, then the probabilities are that we are at fault.

There is no other way that a cavity can be made but by micro-organisms. The action of acids will not produce cavities. It is only by the action of a digestive ferment that they are formed. Every

tooth contains basis substance, and it is not only by the dissolution of the lime salts; but by the dissolving out of the basis substance that cavities can be formed. Those who oppose the germ theory have never given any plausible opinion as to how cavities are formed.

In regard to the question of natural and artificial caries, artificial caries is identical in its histological appearance with natural caries and no one can tell the difference.

Dr. Atkinson—I can tell.

Dr. Sudduth—I will take a number of slides of each, and guarantee that Dr. Atkinson or no one else can tell the difference.

The micro-organisms follow in the line of the tubules, and go from one to the other through the lateral branches as well so beautifully shown last evening. Dr. Atkinson criticised what I said regarding their physical appearance. He misapprehended me. I said that we did not have to depend entirely upon the microscope. We can, in many instances, differentiate the several varieties by their physical appearance in the test tube. It is not absolutely necessary to use high powers. Different varieties have essentially different physical characteristics, such as variations in color, as was demonstrated last evening. Others differ in the rapidity with which they liquefy gelatine; still others in the form of the growths, or the shape of the colonies on plate cultures. To understand these different expressions and to a full understanding of the subject it is essential that one have more or less practical experience in the laboratory. One conspicuous fact is brought out in all these discussions and that is that the opponents of the "Germ Theory" use the terms, "I think," "I believe," etc., showing their lack of positive knowledge on the subject, while those of us who have worked on the subject have at least a basis of fact to go upon. It is an eminently practical subject and one capable of demonstration, and we gave you a demonstration of the presence of the germ in the dental tubuli last evening.

Dr. Werner, Boston—I desire to call the attention of the speaker to the resistive power in the tooth while it is alive.

Dr. Sudduth—In my opinion the only resistance offered by the tooth is expressed in the pulp chamber in the development of secondary dentine. The tooth, except for this, is a perfectly passive

sive agent. I have given this subject more attention than any other phase of caries. It has been held that a zone of resistance is thrown out by the tooth in advance of the forming cavity. No experiments have ever been made that substantiated the statement; it therefore remains the merest speculation. On the other hand the experiments of Dr. Miller show that there is probably no increase in the amount of lime salts found in the, so called, zone of resistance. The chances for error are so great that I very much doubt if the question will ever be satisfactorily settled by chemical analysis. I think the best answer to the question is found in the fact that under similar circumstances, in the same mouth, that teeth with devitalized pulps do not decay any more rapidly than do teeth in which the pulps are alive. Some may dispute this latter statement, but I think that the further fact that there is a growing sentiment in the profession that pulps are not as valuable as they were once considered, bears me out in the statement. This, in my opinion, is a sure indication that clinical experience finds little or no difference as regards the liability of pulpless teeth to decay over those containing live pulps.

EVENING SESSION. THURSDAY, JULY 12, 1888.

Close of discussion on Dr. Allen's paper.

Dr. Geo. S. Allen, New York City—If you remember I said that Dr. Miller had found, as have others, bacteria in the dentinal tubules of carious teeth. I told you that he had obtained a pure culture of these bacteria, and had continued them for successive generations; that into this pure culture he had placed pieces of some healthy teeth, adding to it a fermentable mixture, also sterilized; and that artificial caries had been produced simulating absolutely in all physical characteristics that of natural caries. In the artificial caries the bacteria from the original pure culture were found in the dentinal tubules. What could be more conclusive than that?

Dr. Sudduth also called your attention to the fact that Dr. Miller had gone one step further than most workers in mycology. He has not only produced artificial caries by the action of bacteria; but has found out what the "ptomaine" of the carious fungus is, namely, lactic acid. In the demonstration I gave you on the screen

of artificial and natural caries, I am positive that no microscopist could tell them apart. It is simply impossible. The assertion made by Dr. Atkinson to the effect that from simply looking at these views he could tell the difference is something that passes my understanding. I think it is time that in our dental meetings—when a scientific question comes up, that it should be discussed in the spirit in which it is presented—not simply by making dogmatic assertions. This subject is now so firmly fixed in the minds of all thinking men that it is not likely to be offset by such a line of argument.

Dr. R. R. Andrews, Cambridge, Mass.—Dr. Allen speaks of a case where pieces of dentine were subjected to the action of the fluid. Will he kindly tell us more about the experiment?

Dr. Allen.—The experiment Dr. Andrews speaks of was this: Into a tube containing a pure culture of the bacteria of dental caries pieces of sound healthy teeth which had been previously sterilized were placed. The mixture used was a beef extract, to which 2 per cent. of cane sugar had been added, so as to make it a fermentable mixture. In this tube containing the sterilized beef extract and sugar, and the sterilized teeth, with the pure cultures of bacteria, these experiments were made. The tubes were sealed up with a cotton plug, sterilized, and the whole placed in a thermostat which consists of an oven in which the temperature can be easily maintained for any length of time. At the end of a week the pieces of sound healthy teeth placed in this mixture were so fully decalcified that they could be bent readily, showing that a large proportion of the lime salts had been extracted. There is nothing that will take lime salts out of tooth substance but an acid. It is absurd to talk of breaking up the lime salts by any other way than by the action of some acid. At the end of two weeks the pieces of teeth commenced to show signs of disintegration, and in the course of two or three months the whole tooth had disappeared. These experiments show that there were two agents, at least, namely, an acid which had dissolved out the lime salts, and a peptonizing ferment, which, when the lime was dissolved, had broken down the basis substance of the tooth-animal matter, which is composed of proteids—albuminoids. This experiment Dr. Miller repeated frequently, and there is no question about its value.

Dr. Pierce—The doctor states that the solution used had been previously sterilized, was the object of sterilization, intended to keep out all other organisms except the one desired.

Dr. Allen—That is correct.

Dr. Pierce—If I understand you, the decomposition of the lime salts was through an acid product of the germs placed in the liquid.

Dr. Allen—Yes, the question that Dr. Andrews asked led to the statement of the fact that there was, in addition to the acid present, a peptonizing ferment that carried on the work that the acid left unfinished.

In conversation with one or two dentists this afternoon, and also in listening to my friend Dr. Pierce this morning, the idea came to me that I might say a word in regard to the indirect causes of decay, which was alluded to by Dr. Pierce and Dr. Rhein of New York city. Dr. Miller has investigated fully all these indirect causes of decay, so called, such as fissures, crowded arches, etc., and imperfectly developed teeth. Dr. Miller draws a line of distinction, however, between cause and conditions favorable to decay. The latter are not causes of decay. Dr. Miller appreciates all these points fully and places stress upon the one fact that the active cause of the decay is bacteria, and by the action of these alone he has produced artificial caries showing all the similar characteristics of decay occurring in the mouth.

Subject passed.

Discussion on paper read by Dr. Cheney on "The Treatment of Pulpless Teeth," published in October number.

C. N. Pierce, Philadelphia—This paper was of especial interest, conservative, and markedly correct in the course of treatment pursued. The methods of filling pulp cavities, however, adopted by different members of the profession, varies in different localities, and it is possible that the various forms of treatment may be equally satisfactory.

There is no doubt that the pulp chamber, once thoroughly cleaned, and made entirely free from the debris resulting from dead pulp or food, and well-filled should, in a majority of cases, remain entirely healthy—healthy as regards any subsequent disturbance that will injure the pericementum. We have, however, a great

many patients that are predisposed to irritability of tissue, and the fact that we have disturbed the normal circulation of the tooth, by diverting the flow of blood from the pulp to the pericementum, produces a pericementitis on very slight occasion. The pericementum thus often becomes the seat of irritation, and very often of inflammation. Because a tooth becomes affected with pericementitis after the pulp has been destroyed, and the root filled, is no evidence that it has not been done in a proper manner, or as perfectly as possible. We may find in one patient a condition that would produce perfectly healthy results, while in another patient, owing to abnormal conditions, bad results may unfortunately occur simply through the different constitutional tendencies of the patient, so that it is not safe to condemn a method of practice, or a condition that exists because the patient is suffering from pericementitis.

In my practice in filling pulp chambers, whether pulps devitalized by myself or pulps dead for some time, I prefer to use oxide of zinc mixed with chloride of zinc in preference to gutta-percha, and I like it because of its thoroughly antiseptic property. I fill all the roots with what might be termed "oxychloride of zinc," mixing it in the form of a thin paste. Gutta-percha is not a therapeutic material; it is a mechanical agent. In many cases we want more than the filling of the root—we want an agent for filling that has antiseptic properties, and those we get in the chloride of zinc; and I get better results with it than with gutta-percha.

When I recall the years of experience of many in practice, and see the large number of teeth that are saved—saved for years without the pulps—I think it a pretty good record for pulp devitalization, and while I feel that the tooth is better with a live pulp, if it is possible to save it—when the pulp is exposed, and beyond the hope of salvation from local or constitutional conditions, I consider it is good practice to devitalize it. The results of such practice encourage us in so doing.

The question of filling or treating teeth is one that interests every dentist, and one that comes home to every practitioner, and we ought not to be at a loss for any amount of expression on this subject; for every one has cases to treat, and each one's experience is worth something.

Dr. C. T. Stockwell, Springfield, Mass.—I would like to ask Dr. Pierce if the chloride of zinc has anything more than a momentary antiseptic quality, if after it is used it does not become inert?

Dr. Pierce—When I place oxychloride in the root I place it in very thin, and do so by wrapping my instrument with some very short fibres of cotton, and pass it in, using a pressure sufficient to cause the fluid to thoroughly saturate the walls of the pulp chamber. By so doing, if any pulp tissue has been left in the canal, it becomes saturated with zinc, and is protected from decomposition.

I sometimes find that cavities which have been filled with gold or gutta-percha, some months afterward become offensive, because gutta-percha in the pulp chamber has to a certain extent become disintegrated; whereas with chloride of zinc we have no disintegration.

Subject passed.

Discussion on Dr. Fillebrown's paper, read by Dr. Thomas Fillebrown, of Portland, Me., on "The Relations of the Teeth and Palate to Vocalism."

Dr. C. N. Pierce, Philadelphia—To criticize the paper is beyond my capacity. I can only say that its conception, its thoroughness and the manner of presenting it have been almost perfect. I would simply say that, in regard to articulation, I should like to have time to call the attention of the audience to the importance of the teeth in certain sounds; because it is a matter of great importance to us regarding the replacement or retention of those organs. Many of us, oftentimes, greatly impair the speech of our patients by the awkwardness or imperfectness with which we insert dentures; oftentimes by our means of correcting certain defects and leaving spaces between the teeth, patients complain that they are biting their lips or cheek, when it is simply their effort, with the lips or cheeks, to supply the office of the lost tooth in order to make the cavity essential to articulation. I have given more attention to this feature of the question.

Dr. Charles C. Barker, Meriden, Conn.—I would like to ask Dr. Fillebrown the function of the uvula. That falls under the head of oral tissues. It touches a point I am very much interested in. I would like to ask him the function of the uvula in the production of tone.

Dr. Thomas Fillebrown—My researches have not gone far enough for me to know what the office of the uvula is; persons *seem* to

speak just as well after it is gone as before. I think that it has its place. I am a firm believer that the Cresset never made anything which was not needed. The office of the spleen is not well understood; yet it is an essential part of the body. So with regard to the uvula.

Dr. Ottolengui—What part do the tonsils play?

Dr. Fillebrown—If they are too large they impede the voice. They then form a mechanical obstruction.

While I recommend the removal of a portion of enlarged tonsil; yet I would not remove any considerable portion. After the operation absorption will soon take care of the rest. In regard to the obturator, the action of the muscles would draw down in front of the hinged end, and will throw it back. The obturator should be long enough to come down to the bottom of the uvula, so that when it springs back it will strike against the basilar process. I reached that conclusion only a short time ago. I made two obturators for a patient, and she had trouble with them. I studied the matter, and finally made a third one, and made it spring up; and it seemed that her basilar process was lower than common. I made one for her so that when it sprang back it would hit the basilar process, and she has improved wonderfully.

I had a case of a young man studying for the priesthood. Although very bright, his deformity shows the impropriety of his selection of a profession. He has a cleft clear up to his hard palate, and could not talk well enough to be heard. I have helped him out wonderfully. I made him an obturator, and he has labored hard in the practice of vocalism; and where he formerly had a strident voice, it is now considerably softened, and he can speak the mutes without difficulty, and gets his vowels in good shape.

Dr. H. A. Baker, Boston—This is a subject I am somewhat interested in. I do not want to criticize Dr. Fillebrown's paper, except in one statement, and that is in speaking about the nose—"he talks through his nose." Now all of you can try this. Close your nose and you can give all the alphabet but m and n. He is perfectly correct in regard to articulation and resonance. They are two different things. A person with cleft palate can articulate as well as any one; but resonance is so indistinct that he can hardly be heard.

This calls to mind a case I had a number of years ago—a case where a polypus had been taken out of the nose, and there was an immense cavity. I put in an obturator, and the patient could articulate as well as any one, but the resonance was very bad. As many of you know I have had experience in some one hundred cases covering a period of nearly twenty years. He speaks about the “ball obturator.” I think one of my first experiments was an obturator similar to what he has shown on the board, almost like it, with the exception that it had a piece of flat rubber stitched on to articulate with the pharyngeal wall; but I have had better success with others. I think I have something like ten cases in which I do not think a person in the audience could detect any deficiency in the articulation.

(CONTINUED.)

AMERICAN AND SOUTHERN DENTAL ASSOCIATIONS.

JOINT MEETING HELD AT LOUISVILLE, KY., AUGUST 28, 29, 1888.

REPORTED FOR INDEPENDENT PRACTITIONER BY “MRS. M. W. J.”

The American and Southern Dental Associations met in joint session at Louisville, Ky., August 28 to September 1, 1888. The Galt House was made general headquarters for the majority of the members of both associations.

The National Association of Dental Faculties and the National Board of Dental Examiners held their sessions in the Galt House parlors. Exhibits, clinics, committee meetings, separate meetings of the two associations, and the joint meetings of both, all found ample accommodations in the elegant building of the Female High School, which had been secured for the occasion.

ADDRESSES.

Each association having held a meeting at 9 A.M., Tuesday, Aug. 28, they met in joint session at 11 A.M.

The opening proceedings were presided over alternately by Dr. Frank Abbott, President of the American, and Dr. B. H. Catching, President of the Southern Association; Drs. Geo. H. Cushing and L. P. Dotterer, Secretaries, and Drs. J. N. Crouse

(*pro tem.*) and H. A. Lawrence, Treasurers, of the respective associations occupying seats on the platform.

Mayor Jacob and the Rev. Mr. Moore, of Louisville, were escorted to the platform by the executive committee.

The Rev. Mr. Moore delivered a short prayer, asking a blessing upon the work about to be entered upon, after which Mayor Jacob delivered a brief but cordial address of welcome. Dr. A. G. Rawls, on behalf of the Kentucky State Dental Association, gave the associations a most cordial welcome to "hosts sincere and hands outstretched," to which Dr. E. G. Darby, of the American, and Prof. J. Y. Crawford, of the Southern, responded.

Dr. Darby, in accepting the hospitality of Kentucky, said that it had been observed that if a distinguished gentleman was in search of a beautiful wife, to shine at the capital of the nation, he went to Kentucky for her. If a millionaire politician wishes to present the Chief Executive with a pair of thoroughbred horses, he goes to Kentucky for them. If an epicurean tippler wishes to tickle his own palate, he sends to Kentucky for the wherewithal.

Prof. Crawford dwelt at some length upon the illustrious names Kentucky has furnished to the rolls of medicine, surgery, and dentistry.

At the conclusion of his address the meeting adjourned to 7:30 P.M., when the two Presidents delivered their addresses.

Dr. Frank Abbott, President of the American Association, called attention to the advances made by the profession in the past few years, the increased facilities for a thorough dental education, brilliant achievements of American dentists, and the giant strides made through microscopical researches.

Dr. B. H. Catching, President of the Southern Association, took for his topic the question: "Is the average dentist of to-day a specialist in medicine?" He took the ground that the present system of dental college education does not raise the student to a sufficiently elevated scientific standing. The average dentist looks upon his vocation as a mechanical trade rather than a scientific specialty. While mechanical ability is requisite, a scientific knowledge of medicine and surgery is essential. The average dentist is proficient in that which equips the artisan; but deficient in that which entitles him to recognition as a specialist in medicine. He cannot

ers the present system of dental education too narrow and contracted to permit the highest conceptions of the possibilities of our grand calling. Higher qualifications, a broader curriculum, an extension of time, are the demands of to-day. The surgical part of dentistry is its most distinctive feature. The general surgeon is master of medical science in so far as it is taught in the medical schools, and so of all specialists in medicine—the oculist, the otologist, the dermatologist, and all the others—the dental surgeon alone is not master of medical science, because he is not taught in the medical school. Hence he reaches the conclusion that the dental student should first pass through the medical college and receive the degree of M.D., and then enter the dental infirmary, where he would be taught the practical methods of the dental surgeon, the manipulative art of the dental operator. He also spoke of the importance of a more thorough training in medical science in view of legal complications, the degree of M.D. affording protection in certain contingencies which the degree of D.D.S. alone does not secure.

This paper elicited a very animated discussion, participated in by Profs. Truman, Morgan, Crawford, Pierce, Carpenter, Drs. N. J. Roberts, Cushing, J. J. R. Patrick, Brophy, H. A. Smith, Ottofy, Jas. Johnson, Sudduth, Freeman, Friedrichs, Peabody and others. While it was universally admitted that a certain degree of medical science and knowledge of *Materia Medica* was necessary, it was held that this was included in the curriculum of the dental college. To the dentist mechanical skill is essential, and a training of hand and eye, which is not to be looked for in a medical school. Dr. Roberts thought that the average dentist, who had not been educated in general medicine, would not be able to follow out the line of treatment in cases of necrosis, blood-poisoning, tetanus, etc., and without the degree of M.D. would have no protection in case of fatal results.

Dr. J. J. R. Patrick said that neither common law nor criminal law would hold a man guiltless, if guilty, no matter how many diplomas he might hold, or how many degrees he might claim.

Dr. Brophy said that a man who had been educated for a certain line had a right to follow that line. Under the diploma of a certain institution he had a right to practice anything taught in that institution.

Dr. Sudduth said that everything depended on the ability of the individual. If the operation performed was not taught in the college from which he held his degree, the jury would be prejudiced by that fact; but if he could show that he was skilled and competent, the prejudice could be overcome.

In closing the discussion, in which many other points were brought out, Dr. Catching said that one fact was patent. If a physician administers chloroform with fatal results, he has only to say: "Heart failure!" and he is all right. On the other hand, if the dentist meets with the same misfortune, the physician has to give the certificate, and if it is adverse to the D.D.S. he goes behind the iron bars. Dr. Catching humorously congratulated his opponents on the fact that the majority of them were college professors, with the degree of M.D., to which many of them attached so much importance that they ignored their D.D.S. entirely.

JOINT MEETINGS FOR PAPERS AND DISCUSSIONS.

Joint meetings of both Associations were held daily at 9.30 A. M. and 7.30 P. M., to hear the reports of standing committees, reading of papers recommended by the committee, and discussion of the same.

All of the papers presented by a committee were read in succession, the discussion covering all of the subjects brought forward in the different papers. This plan, though open to some objections, was adopted as the only practicable method of getting through with the vast amount of work before the two Associations. Each committee was represented by a chairman from both Associations.

EVENING SESSION, AUGUST 28.

The report of the Committee on Operative Dentistry was called for.

GEO. H. WINKLER, *South. Assn.*, } CHAIRMAN.
E. T. DARBY, *Amer. Assn.*, }

Dr. Darby responded in the absence of *Dr. Winkler*, to whom it had been allotted.

Dr. Darby reported four papers and some appliances. The subjects attracting most attention were immediate root filling, re-plantation and the use of copper amalgam. The great discussion

made in the use of germicides has so removed the danger of septic contagion, that great operations are now safely undertaken. Implantation is undoubtedly a success for the time being; but time alone can solve the problem as to its durability. Copper amalgam has made its way, and retains its position as the best filling material in a certain class of cases.

Dr. W. Storer How read a paper on

PORCELAIN INLAYS,

illustrated by numerous specimens, which were handed around for inspection. The details for manipulation, both of cavity and of porcelain stopper, are substantially the same as given in the *Cosmos*, July issue.

Dr. J. J. R. Patrick read a paper on

METHODS OF MOUNTING ARTIFICIAL CROWNS,

the method being practically as reported in the proceedings of the Illinois State Society in its recent meeting at Cairo.

Dr. C. E. Kells, Jr., made a number of interesting experiments, illustrating

THE CONDUCTIVITY OF FILLING MATERIALS,

by means of a very delicate thermostat, the expansion of the different materials ringing an electric bell at varying intervals of time, according to the conductivity of the material.

Dr. H. Gilmer read a paper describing his method of making cheap crowns, which are a recognized necessity for many of our patients who cannot afford the more costly gold and porcelain crowns. In Dr. Gilmer's method a platinum band is fitted to the prepared root, and filled with modeling compound, the patient biting to give the correct articulation. This is removed from the mouth, and, after any necessary trimming, invested in plaster. This is drilled, the wax removed, and Weston's or Watt's metal poured, making a low-priced, easily made, serviceable crown for the posterior teeth. For the anterior teeth a low carat gold band may be used, with porcelain facing. The subject of crowns and the preparation of roots, called forth a lengthy discussion of the proper methods of dealing with exposed pulps—whether too many pulps were not being ruthlessly destroyed to make place for the pins and posts of artificial crowns, and whether it is not time to

call a halt and return to more conservative methods. The discussion showed that the younger members as a rule repudiate pulp capping *in toto*, while the older members advocate the preservation of the pulps.

Drs. C. N. Pierce, W. H. Atkinson, Allport, Freeman, Morgan, Taft and E. T. Darby spoke eloquently and earnestly in favor of giving the pulp every possible chance.

Dr. Pierce would canterize the pulp, and so get a non-conducting surface under the filling.

Dr. Atkinson touches the pulp with cresote and places over it a concave cap of gold.

Dr. Freeman does not wish to kill a pulp with arsenic. If they are going to die they will die more kindly, the kinder we treat them.

Dr. Taft considers that devitalization is followed by deterioration. There is loss of continuity of structure; the tooth breaks down, independent of decay; it wears rapidly under attrition, and seems to wear away. The pulp furnishes the nutritive material through which the dentine lives and retains its sensibility.

Dr. Morgan thinks that, though the cementum continues to be nourished by the pericementum after the death of the pulp, so that a pulpless tooth is not necessarily "a dead tooth," it is nevertheless partially devitalized, and consequently not in as good condition as one which is alive in all its parts.

Dr. Patrick, on the other hand, considers it contrary to all experience, contrary to physiology, that a ruptured, bleeding pulp can recover; that it has never been proved that it is possible. The office of the pulp is to produce dentine, and after that has been accomplished all the pulp can do is to wall itself in, dentinification continuing from the circumference clear to the center; the roots in old people being sometimes completely filled up.

Dr. Cravens said that from the time the tooth is formed the pulp labors to kill itself, by progressive calcification, the dentine becoming quite insensible and the tubuli all plugged up thus receiving no nutrition. He is convinced that in the mature tooth the pulp is of little essential service.

Dr. Kells said that in a hundred cases of pulp-capping he would look for ninety-nine failures.

Dr. Story (Texas) has never been able to save a diseased pulp. He uses arsenic every time and fills with oxychloride of zinc, and never has any further trouble.

Dr. Darby has been very successful for twenty-five years. He applies to the surface of the pulp a soft paste of oxide of zinc and creosote, followed by oxychloride, finishing usually with gold. He has one case in which a pulp has been capped three times, from different cavities of decay, and is living now, responding to every test.

Dr. Truman had not found it possible to save seventy-five per cent. of exposed pulps. If the pulp has been irritated and congested he deems it next to impossible to save it. Where the individual possesses extreme vitality and all conditions are favorable, it may be possible to save an exposed pulp; but it is not the rule. He does not agree with *Dr. Taft* as to the deterioration of pulpless teeth. The dentine is covered by the cementum, which is nourished by the pericementum, and so kept in health.

HISTOLOGY AND MICROSCOPY.

Dr. Wilson, Burlington, Iowa, read a short paper on The Apical Portion of the Cementum in its Physiological and Pathological Relations.

After describing the structure of cementum, and the function of its surrounding membrane, he said that the main point of interest was the fact that though a devitalized pulp does not interfere with the vitality of the cementum, yet in destroying the pulp the apical portion of the cementum is sometimes destroyed, and necrosis ensues, through the effect of arsenic applied to the pulp, reaching the cementum through the canaliculi. A portion of the cementum being dead, nature must dispose of it; this is accomplished through solution of the lime salts. For this reason arsenic should be used with great caution. If the first application fails there is danger in a second, and more so in a third application. Many incurable abscesses are the result of arsenical poisoning.

Dr. Atkinson said this paper had a close bearing on the occult movements in nutrition and de-nutrition.

We may burr out all diseased tissues in pulpless teeth—one-eighth or one-quarter of an inch without fear; then disinfect and leave.

Arsenic acts through the affinity of arsenious acid for the protoplasmic tissue in the pulp, and its activity depends upon how much semi-fluid material there is. If only the legitimate quantum it will sleep till Gabriel's trump.

How many have extracted a tooth, felt of the end of the root, and finding it rough, say: "Yes, that tooth had to come out." But if he had got at the end of the root and treated it properly it would have been all right in its own place.

Dr. Frank Abbott, read a paper entitled "The Odontoblasts in Relation to Developing Dentine."

Dr. Abbott first reviewed the secretion theory, to which he, with many others held, for a long time, but which had never satisfied him, and which he had abandoned for the transmigration theory, especially as applied to developing dentine, which supposes no refinement of structure at all other.

The main mass is not cartilaginous, but glassy looking, infiltrated with lime salts. The only cells are the odontoblasts, which send offshoots upward and downward to the papilla, only the outer layer of the pulp only being concerned in forming dentine. He denies that the whole pulp is transformed.

Dr. Abbott quoted the theories of Drs. Andrews, Eschschek and Heitzman, as to the origin of the dental fibrils, whether they are the remnants of the central portions of the odontoblasts or have their origin between the latter, Andrews maintaining that only certain pear-shaped odontoblasts are fibril cells. Eschschek and Heitzman that the odontoblasts split up into medullary or embryonal tissue corpuscles, the living matter remaining undivided. (See article on eburnitis.) The return of the odontoblasts to medullary tissue, before infiltration with lime salts, solves the vexed question as to the continuous mass of dentine structure, it being only exceptionally stratified, as in a nap.

The discussion which followed the reading of this paper was confined to Drs. Sudbuth and Abbott, the former maintaining the secretion theory, especially for the hard tissues, through the deposition of lime salts, the action of the odontoblasts in the dentine, of the ameloblasts in the enamel, of the osteoblasts in bone. He said that Dr. Abbott made no distinction between the cortical and cancellous portions of bone, these being secreted in different ways. In

the cortical portions a sheath is laid down, from a membranous, in such a way as to form a cortically layer which is secreted with regularity, and only in certain lines and certain places; and so of dentine—there is a power which directs this secretion, which does not occur indiscriminately. He said that Dr. Abbott also ignored the nuclear structure of tissues. Dr. Sudduth said that he had visited the laboratories of Drs. Bodecker and Hirtzman, and been shown some of their specimens; but was unable to see whence they drew their conclusions. In specimens carefully stained the nucleus can be clearly seen, but in their specimen it could not be made out, so that they proved nothing. The study of the secretion of shells substantiates the theory of the secretion of enamel and other hard tissues.

Dr. Abbott, in reply, said that if we did not differ in opinion, we should never learn anything. Different men can look at the same thing, with the same glass, and yet see and understand in widely different ways. No two will see alike. The secretion theory contemplates a row of odontoblasts, their distal ends in contact with the ameloblasts, and which secrete lime salts and all other substances which fall back and are found around the pulp. Kollicker concluded, in 1850, that this could not be; that the odontoblast itself becomes dentine, another row forming underneath, the nucleus splitting up again and again and the odontoblasts increasing in length. This seems more rational than the secretion theory. Another theory is that the odontoblasts become calcified, beginning at the centre and working to the periphery; this is denied by many. In every odontoblast there may be discovered a reticulum full of little nuclei; but this is only a provisional step in the formation of dentine.

There is a layer of tissue between that inhabited by organisms and perfect dentine, that has never been explained except on the reaction theory. In the process of caries, if we take a section of dentine with the cavity in it, we find the first layer of carious substance soft, and filled with micro-organisms—micrococci and leptothrix principally—deeper in we find a layer, which by process of staining colors different from the other—micro-organisms penetrate to a certain extent—but as we go further we find a yellow stain; the line of demarcation is very plain. We find dentine broken down, disorganized, yet not an organism.

The living matter—glue-giving basis substance—responds to irritation, takes on inflammatory conditions, but organisms do not cause decay; they come there because there is decay.

Dr. Sudduth said that no theory ever yet advanced explained the production of the cavity, except the germ theory of Dr. Miller of Berlin. Lactic acid dissolves lime salts, but the form of the dentine is unchanged. Certain bacteria of the human mouth, developing in decalcified dentine throw out a digestive ferment, which breaks down the form of the tooth. The age of decay gives the different colors—yellow first—as seen by Dr. Abbott. Dr. Miller stands pre-eminent in this line of investigation and discovery, and as time rolls on he will get the credit due him.

Dr. Abbott replied that the lime salts are not dissolved out; we find under the excavator that they are there, though broken down. In the cavity everything is gone. Whether micro-organisms have chewed it, or whether they are at all to blame for all this, is of no importance. If the teeth are kept perfectly clean they will not decay; there are undoubtedly organisms in the mouth as everywhere else.

Dr. Sudduth.—If you do not give credit to the part micro-organisms play in decay, then how do you explain the formation of the cavity?

Dr. Abbott.—No cavity is formed except by acids; but whether from decomposing food or from micro-organisms is indifferent to me. When it gets through the enamel it reaches tissue composed of living matter; this becomes irritated; by the inflammatory process lime salts are displaced, melted down, and embryonal tissue is formed; the dissolved lime salts are washed out and carried away the same as any other product.

Dr. Sudduth.—The admission that the breaking down may be due to micro-organisms is the very thing claimed. A tooth may remain indefinitely in putrifying mixtures and no effect will be had on it. There is only one form of micro-organism that can produce the dissolution of the basis substance and form a cavity.

Dr. Abbott, in conclusion, denied that he had made the admission accredited him by Dr. Sudduth.

[TO BE CONTINUED.]

PROCEEDINGS OF
THE NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

AT THEIR SEVENTH ANNUAL MEETING HELD IN LOUISVILLE, KY., AUGUST
27TH, 28TH AND 29TH, 1888.

The Seventh Annual Meeting of the National Association of Dental Examiners was called to order by the president, Dr. Geo. H. Cushing, at the Galt House, Louisville, Ky., August 27th, 1888, at 8 P. M.

Dr. Fred A. Levy, Secretary.

Dr. Cushing explained that as he was no longer a member of the Illinois State Board of Examiners, he could not be considered a member of the National Association, so vacated the chair in favor of the Vice-President, Dr. T. S. Waters.

Roll call showed the following State Boards represented :

Illinois, Drs. C. R. E. Koch and R. N. Lawrance ; Georgia, Dr. S. B. Barfield ; New Jersey, Dr. Fred A. Levy ; Mississippi, Dr. W. W. Westmoreland ; South Carolina, Dr. G. F. Wright ; Ohio, Drs. J. Taft and H. A. Smith ; Indiana, Drs. P. G. C. Hunt and S. T. Kirk ; Maryland, Dr. T. S. Waters ; Kentucky, Dr. A. O. Rawls ; Wisconsin, Dr. B. G. Macreklein.

The following letter from the Wisconsin State Board was then read and placed on file :

STATE BOARD OF DENTAL EXAMINERS, WISCONSIN.

LA CROSSE, AUGUST 20TH, 1888.

FRED A. LEVY, D. D. S.,

Secretary National Association of Dental Examiners.

DEAR SIR :

It is not positively known that any number of this Board will be present at the coming meeting of the Association at Louisville. Permit us, however, to respond present upon the roll call in sentiment if not in person. There are one or two matters which it seems advisable to bring before the Association, the most important of which has bothered us, viz.: The licensing of first course college students. The practice does not seem right, although they correctly answer the required percentage of questions submitted at their examination. The average standard of qualification for graduation at our colleges is low enough, and for a State Board to license a person who has acquired but the half or even less preparation demanded by the college, seems to represent it as being satisfied with an inferior standard, and willing to admit into practice men of inferior capabilities or less preparation. Doubtless all State laws providing for examinations in lieu

of a diploma may be considered weak in their conception of competency or in the disposition to enforce the law in the interest of a higher degree of excellence, and until public sentiment shall have been aroused to permit our laws to be changed, making the diplomas the only lawful qualification. Some uniform method might be recommended to assist us and others to overcome this doubtful practice.

2. State Boards cannot be expected to meet often than once in every six months. If there is any provision in any State enactment which provides for "temporary licenses," we have not discovered them. So that there is no authority for granting the privilege of engaging in practice in the interim, which is sometimes a source of inconvenience and loss of applicants. If the Association or representatives of any Board can suggest the right course to pursue in this matter such advice will be very acceptable.

3. Is it not desirable to have a better and more uniform list of questions to govern State Boards in examinations? The Association can improve upon their former efforts in this direction by the appointment of a committee to formulate such list to be submitted at the next annual meeting.

The enclosed copy of our third annual report will show the statements regarding the workings under our law which we regard as one of the best conceived. All members of the profession in the States seem to be well satisfied with its provisions; the Board is harmonious and in earnest in carrying it, and extends greeting to all who are laboring to accomplish the same objects.

Respectfully Submitted,

CHARLES C. CHITTENDEN,
President.

ERLIE FALMER,
Secretary.

On motion a Business Committee of three was appointed, and the communication referred to them. The chair appointed Drs. Taft, Koch and Barfield the Committee. Dr. Koch asked for information as to the standing of the Dental Department of the Howard University; also Dental Department of the National University, both of Washington. On motion the following resolution was adopted:

Resolved, that the Secretary be empowered and requested to have printed five hundred copies of the constitution, by-laws, and standing resolutions. Also the following:

Resolved, that a Committee of three be appointed to prepare a list of the Dental Colleges which this Association will recommend to the various State Boards whose diplomas may be accepted instead of an examination.

Carried. President appointed Drs. Levy, Hawley and Wright. The meeting then adjourned.

Aug. 28th, meeting called to order. Dr. Watson in the chair; Dr. Levy, Secretary. Minutes were read and approved. Delegates Dr. M. C. Marshall and L. G. Roberts, from the Arkansas State

Board, were present and joined the Association. Business Committee reported as follows:

Your Committee to whom was referred the letter of Dr. Edgar Palmer, Secretary of the Wisconsin Board of Examiners, respectfully recommended the discontinuance of the practice of giving permits to practice dentistry to students during the time of their college work or before their graduation.

We also recommend that any applicant for examination and license to practice dentistry between the regular sessions of the respective State Boards may be examined during such interval by one or more members of a State Board as may be designated by said Board, and upon such examination being satisfactory, a permit may be issued to the applicant to practice dentistry till the next meeting of the Board and no longer. This examination and permit shall in no case exempt the candidate from an examination by the full Board at its next regular meeting. Your Committee does not believe it advisable to have a uniform list of questions for examination throughout the country. We would recommend, however, that State Boards embrace in their examinations the following branches, and that there be not less than ten questions on each of these branches, viz.: Anatomy, physiology, pathology, histology, hygiene, materia medica, therapeutics, chemistry, metallurgy, operative dentistry, prosthetic dentistry and dental jurisprudence. We suggest that each State Board formulate its own list of questions, and that this list be changed at least once each year, and that a standard of at least seventy-five per cent. of correct answers be required.

J. TAFT,
CHAS. R. E. KOCH, } Committee.
S. B. BARFIELD,

Received and adopted. The Committee on List of Colleges offered a report which was accepted. Dr. Koch resigned from Business Committee on account of having to leave the city, and Dr. Lawrence was appointed in his place. The following resolutions were then offered:

Resolved, that the resolution appearing upon the records of this Board, the same being presented in writing by Dr. Coyle and unanimously adopted by this Board at its meeting at New Orleans, the said resolution being in effect to prevent members of faculties from acting as members of State Boards of Dental Examiners, be hereby rescinded.

Carried.

Resolved, that a Committee of three be appointed, whose duty it shall be to co-operate, so far as they can, with the profession in the different States in securing a uniformity in the laws regulating the practice of dentistry in the States.

Carried. President appointed Drs. Taft, Rawls and Barfield.

Resolved, that the State Boards be requested to furnish the Secretary of the National Association of Dental Examiners with a certified copy of the laws in force and any amendments in their respective States and their efficiency.

Carried. Adjourned.

August 29th: meeting called to order. Dr. Waters in the chair; Dr. Levy, Secretary. Roll call showed the following States represented: Illinois, Ohio, Georgia, Indiana, New Jersey, Maryland, South Carolina, Wisconsin, Kentucky and Arkansas. Minutes of last meeting read and approved on motion. The list of colleges presented and accepted at the last meeting was reconsidered. The list was then referred back to the Committee to be revised, and was again presented to the Association; was amended and accepted, as follows:

1. Baltimore College of Dental Surgery, Baltimore, Md.
2. Boston Dental College, Boston, Mass.
3. Chicago College of Dental Surgery, Chicago, Ill.
4. Harvard University, Dental Department, Cambridge, Mass.
5. Kansas City Dental College, Kansas City, Mo.
6. Minnesota Hospital, Dental Department, Minneapolis, Minn.
7. Missouri Dental College, St. Louis, Mo.
8. New York College of Dentistry, New York City.
9. Ohio College of Dental Surgery, Cincinnati, O.
10. Pennsylvania College of Dental Surgery, Philadelphia, Pa.
11. Philadelphia Dental College, Philadelphia, Pa.
12. St. Paul Medical College, Dental Department, St. Paul, Minn.
13. University of California, Dental Department, San Francisco, Cal.
14. University of Iowa, Dental Department, Iowa City, Ia.
15. University of Michigan, Dental Department, Ann Arbor, Mich.
16. University of Pennsylvania, Dental Department, Philadelphia, Pa.
17. Vanderbilt University, Dental Department, Nashville, Tenn.
18. Northwestern College of Dental Surgery, Chicago, Ill.
19. Louisville College of Dentistry, Louisville, Ky.
20. Indiana Dental College, Indianapolis, Ind.
21. Dental Department of Northwestern University, Chicago, Ill.
22. Dental Department of Southern Medical College, Atlanta, Ga.
23. Dental Department of University Tennessee, Nashville, Tenn.
24. School of Dentistry of Meharry Medical Department of Central Tennessee College, Nashville, Tenn.

The Association then proceeded to the election of officers with the following result: President, Dr. T. S. Waters, of Baltimore, Md.; Vice-President, Dr. S. T. Kirk, Kokomo, Ind.; Secretary and Treasurer, Dr. Fred A. Levy, Orange, N. J.

On motion it was resolved that when we adjourn we do so to meet on the day and at the place of meeting of the American Dental Association, at 9.30 A. M. (I. e. Saratoga, Tuesday, August 1th, 1889). Minutes were then read and approved and the meeting adjourned.

FRED A. LEVY, Secretary.

Editorial.

THE NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The fifth annual session of this association was held in the Galt House parlors, Louisville, Ky., Aug. 27th, 28th and 29, 1888. The following colleges were represented :

Baltimore College of Dental Surgery, M. W. Foster and B. Holley Smith ; Boston Dental College, J. A. Follett ; Chicago College of Dental Surgery, A. W. Harlan, T. W. Brophy and J. N. Crouse ; Harvard University, Dental Department, Thos. Fillebrown ; Kansas City Dental College, J. D. Patterson ; Missouri Dental College, W. H. Eames ; New York College of Dentistry, Frank Abbott ; Ohio College of Dental Surgery, H. A. Smith and G. Mollineaux ; Pennsylvania College of Dental Surgery, C. N. Pierce ; Philadelphia Dental College, S. H. Guilford ; University of Iowa, Dental Department, A. O. Hunt, L. C. Ingersoll and I. P. Wilson ; University of Michigan, Dental Department, J. Taft and N. S. Hoff ; University of Pennsylvania, Dental Department, Jas. Truman and E. T. Darby ; Vanderbilt University, Dental Department, W. H. Morgan and Henry W. Morgan ; Northwestern College of Dental Surgery, F. H. B. McDowell, E. J. Perry and N. J. Roberts ; Louisville College of Dentistry, A. Wilkes Smith and J. Lewis Howe ; Indiana Dental College, Junius E. Cravens ; University Dental College of Northwestern University, John S. Marshall ; Dental Department of Southern Medical College, L. D. Carpenter ; Dental Department of University of Tennessee, J. Y. Crawford ; School of Dentistry of Meharry Medical Department of Central Tennessee College, G. W. Hubbard ; Dental Department, National University of Washington, D. C., S. J. Cockerill.

The last named college was admitted to membership during the meeting, and completes the list of twenty-three colleges, only one of which was not represented, viz.: The University of California, Dental Department. Two Colleges, the Minnesota Hospital College, Dental Department, and the St. Paul Medical College, Dental Department, had dissolved during the year ; and from their two faculties has been formed the Dental Department of the University of Minnesota at Minneapolis. This and the Dental Department of Howard University were proposed for membership ; but,

under the rule adopted in 1887, their applications had to lay over one year. The meeting was called to order by the president, Dr. A. O. Hunt, of the Dental Department of Iowa University, with Dr. J. E. Cravens, of the Indiana Dental College, acting as Secretary. The question arising with regard to the presence of reporters in a secret session, this difficulty was overcome by a motion to allow the Secretary to appoint as many assistants as were required. Dr. Cravens then proceeded to appoint as clerical assistants the representatives of the several journals present, who were not members of the association. While the committee on order of business was preparing to report, the question of credentials was brought up and fully discussed. From the remarks made it was evident that only a small proportion of those present were empowered to act for their institutions. This difficulty will be remedied another year by complying with a resolution offered by Dr. Bimphly, later in the session, to the effect that "hereafter a delegate representing a college of the association shall be a member of the teaching faculty of such college, and shall present properly executed credentials specifying his authority to represent his college, before he shall be allowed to vote on questions before the association." As it was, if any decided action had been taken at the meeting, but few of the colleges would have felt themselves bound by the action of their representative in case this action did not suit the majority of the faculty. We consider the resolution given above as one of the most essential passed at the meeting. If the colleges live up to it and pass on the resolution offered by Dr. Kames, "that it is the sense of the meeting that the course of instruction in all colleges in this association should be three years of not less than five months each; and that the delegates shall submit the proposition to their respective faculties, and report their action to this association at its next annual meeting, in order that a decision on this question may be had," then we may look forward to some definite action being taken on the question at the next meeting of the association.

A BODY WITHOUT AUTHORITY

As matters stood, it was evident to all present that the association was little more than an educational institution, where questions relating to the welfare of dental education could be discussed and

resolved about; and that aside from the moral influence little else could be accomplished. Our advice in the August PRACTITIONER of leniency towards those schools, that had not lived up to the strict interpretation of the rules and regulations of previous years, was taken, and a probable rupture in one or two directions thus averted. In fact, the association was in no condition to inflict discipline upon any institution, since it is neither an incorporated body, nor even a convention that required credentials in order to gain membership. The extension of the length of college courses was the principle topic of discussion. There seemed to be a general impression that it had to come, and that right early; but just how or when was the open question. The meeting had a decidedly beneficial effect upon the members present, and it seemed a pity that the entire teaching faculty of the country could not be present and listen or take part in the discussions, because no accurate idea of the character of the meeting can be formed from verbal or printed reports. There was a favorable feeling towards the movement, and if any common plan can be agreed upon, we believe that it will be adopted. An apparently insurmountable difficulty in the way of extending the length of the college term, so as to embrace the spring term, arises from the fact that a large number of colleges are departments of medical colleges, in which the term of instruction is only five months. A lengthened term would, of course, make it necessary for the medical men, who hold chairs in the dental faculties, to give a longer course of instruction to the dental than to their medical classes, unless the extended time should be given entirely to clinical and laboratory work. These institutions would much rather extend the time to three years of five months each, than to two of seven or nine months each. On the whole we were favorably impressed with the evident turn the question is taking. What is wanted is to extend the time for laboratory work, as well as for study; for it is evident that manual training is one of the essential features of a dentist's education, and that this can be obtained only by actual time spent in the laboratory and the operating room. A course of study embracing three years of five months each will give more time to the study of the subject than will two years of seven or even nine months each. By the former plan the student will have three winters and two summers; while, by the latter, he will have only two winters and one summer.

A GRADED COURSE.

If a graded course of study could be adopted and manual training could be fully introduced, it would be a long step in advance; students could be taken one year younger, just after leaving the grammar school, before habits of study have been broken off, and could spend the first year in the laboratories and in the study of manipulation, as taught in schools for manual training. This instruction could of course be modified from the present form so as to suit the particular needs of dentists. An instructive lesson was brought out by the roll-call as to what instructions the several representatives had received regarding the matter, and as to what the colleges of those who were not instructed would probably agree to. Nine out of eighteen answering either had already, or were willing to adopt, a three years' course of from five to nine months each. Seven were in favor of extending the present course of two years to six, seven or nine months, and in the case of the New York college to twelve months; no one, however, seemed to understand just what Dr. Abbott meant. Five colleges were absent or failed to report, viz.: Boston Dental College, Philadelphia Dental College, Vanderbilt University, Dental Department, University Dental College of Northwestern University, and University of California, Dental Department. The last two named had no representatives present when the vote was taken. It will be seen from the above table that only two of those that expressed themselves were not in favor of an extension of the length of time. The following is the list as voted by each institution:

	Time	Length of Session
Harvard University, Dental Department.....	2 years	3 months.
Kansas City Dental College.....	2 "	3 "
Missouri Dental College.....	3 " 7 or 9	"
Ohio College of Dental Surgery.....	2 "	3 "
Pennsylvania College of Dental Surgery.....	2 "	7 "
University of Michigan, Dental Department.....	2 "	3 "
University of Penna., Dental Department.....	2 "	7 "
Northwestern College of Dental Surgery.....	2 "	3 "
Louisville College of Dentistry.....	2 "	3 "
University of Tennessee, Dental Department.....	2 "	3 "
National University, Dental Department.....	2 "	3 "

The representatives of the following colleges stated that while they have not been instructed, they felt justified, from what they knew of the feeling of their respective faculties, in announcing their positions on the subject as follows:

	<i>Time.</i>	<i>Length of Session.</i>
Baltimore College of Dental Surgery.	2 years	7 months.
Indiana Dental College.	3 "	6 "
School of Dentistry, Meharry Medical College,	3 "	5 "
New York College of Dentistry.	2 "	12 "
Dental Departm't of Southern Medical College,	2 "	5 "
Chicago College of Dental Surgery	3 " 6 or 9	" "
State University of Iowa, Dental Department,	3 "	5 "

During the forepart of the session considerable reserve was shown by the members about committing themselves; but when once the ice was broken a perfect storm of resolutions was presented looking toward lengthening the course of instruction. The members vied with one another to see who could get his resolution in first; but as there was a standing rule necessitating all resolutions that embodied radical changes to lie over one year, a large number that obtained seconds were laid over. We give a few of these in order to show the spirit of the meeting. The chairman of the Executive Committee, Dr. Taft, offered the following resolution:

Whereas, It is the sense of this Association that less than two years of study and instruction is insufficient properly to prepare any one for the practice of dentistry as demanded by the progress of the times; therefore be it

Resolved, That at least two years of *bona fide* study and attendance upon two full regular courses of instruction, in separate years, be required before graduation.

Mr. McDowell then offered the following as a substitute for the resolution of the executive committee:

Resolved, That after the close of the scholastic year, 1889 and 1890, attendance upon three regular winter courses of instruction of not less than six months each, held in separate years, be required of students by colleges in this association, before examination can be had for graduation.

Dr. Howe offered these resolutions:

Resolved, To substitute for resolution adopted in N. Y., 1884, the following: "Attendance upon three full regular courses, of not less than five months each, in separate years, shall be required before examination for graduating; and no student shall be graduated until at least twenty-eight months after his first matriculation."

Resolved, To amend resolution adopted N. Y., 1884, by inserting in the place of "one year's privilege in a dental office," the words "one course of lectures in a dental college."

Resolved, That recommendation adopted N. Y., 1884, "That three years' study of dentistry, including attendance upon two regular courses of lectures, be required previous to examination for graduation," be made mandatory.

Dr. James Truman offered the following:

Whereas, The present confused condition of dental education in this country, having largely grown out of immature ideas in regard to proper modes of training, as well as modes of expensiveness; and

Whereas, It is vital to the best interests of our profession that we should constantly keep in view that time, repetition of ideas and application combined alone ensure success in any calling; and

Whereas, The profession, through its organized association, has demanded of this association that it raise the standard of training. Be it therefore

Resolved, That in compliance with this forcibly expressed desire, and in conformity with our own convictions, this association decrees that the sessions of the colleges under its jurisdiction shall, at the close of the coming sessions of 1888 and 1889, be lengthened to at least seven months; and be it farther

Resolved, That in the event of the adoption of the foregoing resolution, the spring course of lectures be abolished.

It will thus be seen that the spirit of progress is abroad, and that next year we may hope to see some marked step taken in the direction of higher education.

AN EARNEST MEETING

We were impressed with the evident sincerity shown by the members in their desire to formulate some plan upon which all could unite for the common good. All seemed to appreciate the

need of some co-operative action. Inability to force any movement was only too evident, since the association is held together by bonds too frail for any of its members or even for a majority of them to adopt aggressive measures. It is an educational institution, and must use only such means to inculcate its measures as will foster and not drive out its membership. It is an institution where the representatives of the several faculties can get together, compare notes, and suggest methods of advancement in matters of dental education. While widely differing views were, in some instances, expressed; yet the utmost good feeling prevailed between the members throughout the meeting. Still, we do not want to be deceived by this apparant harmony and outward expression of intentions on the part of the association as a body, for the adoption of rules looking towards the advancement of the standard of dental education. There was no excuse for anything else but harmony. No positive steps were taken, nor indeed could have been taken under two years, that would directly affect the present regulations which the colleges are following. Even if all the colleges take action on Dr. Eames' resolution the present winter, and send representatives to the next meeting, authorized to vote for a three years' course of five months each, which is highly improbable. It is our opinion that there will be a sufficient number who will refuse, claiming that they had sent out their announcements for the year 1889 and 1890, and that it is too late for the new régime to take effect until 1890 and 1891.

This is putting the matter in its most favorable aspect; for if only a few colleges, say one or two of the strongest colleges numerically, shall refuse to enter into the arrangement and be bound by its action, then all farther legislation will be blocked, for there is no power to force them into it. This is shown in the case of the University of Maryland, which to-day stands as a serious menace towards the action of the association. The other colleges will refuse to act for fear of the competition of these institutions.

THE WAY OUT.

It is evident that the only way the National Association of Dental Faculties has to enforce its action is through the National Association of Dental Examiners. They have the law on their side, and have almost arbitrary power as to what institutions, the degrees of which, they shall recognize.

If the National Association of Dental Examiners had at the Louisville meeting passed a resolution to the effect that, after July 1, 1889, the diploma of no college would be recognized that did not require attendance up to, at least, fifteen months of instruction, not including supplementary spring courses, unless such courses were made obligatory. This would have had a most salutary effect, and a large per cent. of the colleges would, irrespective of any action on the part of the National Association of Dental Faculties, adopt either a two years' course of seven and one-half months each, or a three years' course of five months each. During the coming session a test case of the power of the National Association of Dental Examiners to force an institution into line will no doubt be made of the University of Maryland, Dental Department. We wait with considerable interest the result. In the mean time the good work of educating the several faculties as to the need of longer time is going on, and cannot help but have a beneficial influence. Several of the colleges have already taken this step, and we predict that before any decided action has been taken by the National Association of Dental Faculties, a respectable number, if not a majority, will have adopted an extension of time for the course of study. This whole movement may, however, be precipitated by the action of the National Board of Dental Examiners at its next session. We hope that the several State Boards will, during the coming winter, act on the matter, and send their delegates to the next meeting prepared to adopt some regulations looking towards the solution of the problem.

AN ENJOYABLE AFFAIR

By invitation we were present at a banquet given by the Odontological Society of New York, in honor of Dr. J. B. Davenport, of Paris, on the eve of his departure for home. Twenty-one covers were laid at Martinelli's, and a very enjoyable time was had. Dr. Davenport, although a young man, has already won for himself a name among the original investigators in dental science. The high character of his work was the theme of the evening. It was pleasant to see the older men willing to accord honor where honor was due, without that air of "pretty well done for a young man," that sometimes creep into grudgingly given praise. Encourage

the young men, we say; give them a chance and a helping hand, if need be. Better be too lavish with praise than to stint it. We all like to be appreciated. Nothing serves as a stimulant to higher attainments more than to know that if there is not money, there is something better, viz., the satisfaction of having attained something which cannot be purchased with money, and to the possession of which there is no royal road. There were present, beside Dr. J. F. Davenport, as guests of the Society, a brother, Mr. D. T. Davenport, of Passadena, California, and an uncle, Dr. A. F. Davenport, of North Adams, Mass., Dr. J. F. D.'s former preceptor, and ye editor. The members present were:

Drs. W. H. Dwinelle, <i>Chairman</i> .	William Jarvie,
Frank Abbott,	C. A. Woodward,
J. Morgan Howe,	C. F. Ives,
Benjamin Lord,	A. H. Brockway,
S. F. Howland,	F. A. Remington,
Z. T. Sailer,	W. A. Bronson,
J. Bond Littig,	George W. Weld,
S. G. Perry,	W. H. Atkinson,
H. G. Mirrick,	S. E. Davenport.

One thing that impressed us was that the *International Dental Journal Company* was largely represented around the board, and we were farther rejoiced to obtain, during the evening, a promise from Dr. Davenport to act as a foreign correspondent for the *Journal* in Paris. We shall look for some valuable and interesting contributions from his pen. Word has been received of the doctor's safe arrival in Paris.

DENTAL DEPARTMENT OF THE UNIVERSITY OF IOWA.

We call attention to the announcement of the Dental Department University of Iowa, located at Iowa City. The department has been thoroughly organized by the new Dean, Dr. Hunt, and the fall term opens out with bright prospects. A full corps of teachers have been elected, and the seventh annual session promises to be the best ever held. Sixty students have matriculated up to date, Oct. 12, and ten more have been heard from that will come in later. Fifty-six was the largest class previous to this one.

AN EXPLANATION.

Some of our readers who take the *Dental Cosmos* may have thought strange that three of the papers of the Pennsylvania State Society meeting should appear in full in that journal, when we were elected official reporter for the society for the current year. It was especially irritating, in that we had made one of them, that of Dr. Kirk, a leader in our original communications.

We are satisfied that it was an oversight, and accept as the *amende honorable* the explanation found in a short editorial in the October number of the *Cosmos*, as follows:

"Owing to a misunderstanding, some of the papers read at the Pennsylvania State Dental Society, which, by virtue of a prior arrangement belonged to the *INDEPENDENT PRACTITIONER*, were printed in full in the *Dental Cosmos* for September. It is scarcely necessary to say that the *Dental Cosmos* would not wilfully violate the courtesies of honorable journalism or the rights of another journal. It does not, except by inadvertence, print papers that are not intended for its columns, much less those intended for others."

• We do not intend to print any articles under the heading of original communications which have appeared in any other journal; and not only that, but we intend, as far as possible, to have the exclusive control of the proceedings of the societies for which we report, except, of course, if other journals desire abstracts we shall not object. We believe that there is room for us all to follow out different lines, for the benefit of our readers and the journals also.

COMPLIMENTARY.

We desire to call attention to the report of the American and Southern Dental Societies meeting, which is begun in this number by Mrs. M. W. J. While it is only an abstract, and which, by the way, is all we ever intend to print of reports that belong to other journals, yet Mrs. W. has caught the salient points so accurately that no one, even of those who were in attendance, will miss what has been omitted. We have never seen any report that was free from error.

We can well understand, how, by a system of shorthand, a

detailed report can be obtained, provided the reporter is conversant with technical terms.

It is remarkable how a person not acquainted with short-hand, could so enter into the spirit of the meeting as to give such an accurate a report.

We gladly give this note of commendation to Mrs. W., because in her case it is deserved; and because of the fact that the general impression is extant that women cannot, or at least do not, make good reporters. Here at least is a notable exception to the rule, if such it be. What one woman has done others can do, and we believe that the reason that most women have not entered this light and most suitable field of employment is because of lack of opportunity and special training rather than any unfitness of mind or body for the occupation.

EDITORIAL NOTE.

Owing to the extra amount of matter which has been crowded upon us this month we have added a half form to the journal, notwithstanding which, however, several important items which we were desirous of getting into this issue must necessarily be left over until next month.

Current News.

DOMESTIC CORRESPONDENCE.

Editor Independent Practitioner:

In your editorials in the August and September numbers in discussing the question of "Dentistry a Specialty in Medicine," you make use of the word profession several times; we would respectfully query what profession?

Every attentive reader of the dental and medical literature produced during the last five years will recognize the pertinent force of the above query.

From the time that Chapin A. Harris and his coadjutors made overtures to the medical colleges, endeavoring to have dental professorships incorporated in them, and the scornful rejection of their propositions up to about 1883, dentistry was not confounded in thought with medicine by any one. It was understood to have its own literature, colleges, societies, etc.; and the medical fraternity lost no opportunity to give prominence to the fact that dentistry had nothing to do with medicine. Dentistry as an independent profession, however, thrived and grew, and made for itself so prominent a position that its respectability and strength were felt far and wide. Medicine, ever jealous of her supposed preroga-

tives, has noted the healthy pulse, and during the last five years has made great change in her attitude and from her original policy. During this period a persistent attempt has been made by the medical profession to keep it understood that dentistry is a specialty in medicine. This effort has filled our literature with much interesting reading bearing upon the subject, but has in no wise been able to make dentistry a specialty in medicine, but, rather, has continually emphasized the fact that the healing art is in the hands of two great distinct and equal branches—*medicine and dentistry*. Each distinct and independent. This letter is written with the view of calling attention to this emphasis.

Every article that has been written, every speech that has been uttered, advocating dentistry as a specialty in medicine, is filled with the expression, "the profession." Such emphasis shows how deeply implanted *dentistry* is as a profession.

Did space permit I would enumerate and quote from them for the edification of the general reader, but a few taken from your late editorials will suffice.

The italics are ours.

"No one at the present day questions the position of *dentistry* as a branch of the healing art, and as such a *specialty* in medicine." * * * "The individual members of the profession who have done most to secure recognition for the body corporate have been *literally or medically educated men*." * * * "It was through the efforts and personal standing of these men that the *profession* was seated as a body in the American Medical Association." * * * "The American Medical Association did not view to have *recognition of proficiency* in obstetrics to those members of the dental profession." * * * "This question is one of very considerable interest to us as a *profession*."

In speaking of the action of the American Medical Association, you say: "To turn our backs upon them now would be unappreciation, to say the least." It would be hard to tell what is to be appreciated. Certainly not as you put it, "the overlooking of our deficiencies;" certainly not the attempt to gather the glorious work of so many dental years into the medical storehouse, and to share credit for the crop. Truly they seem desirous to "reap where they have not sown." Every one who has taken the pains to test the action of the American Medical Association and the Ninth International Medical Congress, knows the questionableness of the "we have been most magnanimously recognized as specialists in medicine." An adoption is no adoption which "does not establish us as such in the eyes of the law!"

The statement, "Step by step, one after another of the medical branches have been incorporated into the dental curriculum, until now it is considered essential to employ largely medically educated men to instruct in those branches," is inaccurate. The medical branches, so called, were all, and at once, placed in the dental curriculum when the first dental college was established, and have been retained ever since.

In conclusion, we must say that it seems a little peculiar and without reason to warn against the practice of implantation by those holding only the title of D. D. S. The operation is one purely dental in origin and in character, and one that is, and only can be, performed by dentists. This word of caution is directed with "thus are the necessities for broader education being constantly brought to the notice of the *profession*." We would query, What profession?

Respectfully yours, L. ABILEY FAULKNER, D. D. S.,

Oct. 11, 1888.

1423 Arch Street, Philadelphia.

MEDICAL APHORISMS.

A correspondent, signing himself "Artz," sends to the *Canada Lancet* the following professional aphorisms of Amédée Latour:

(1) Life is short, patients fastidious, and the brethren deceptive. (2) Practice is a field of which tact is the manure. (3) Patients are comparable to flannel—neither can be quitted without danger. (4) The physician who absents himself runs the same risk as the lover who leaves his mistress—he is pretty sure to find himself supplanted. (5) Would you rid yourself of a tiresome patient, present your bill. (6) The patient who pays for his attention is but exacting; he who does not is a despot. (7) The physician who depends on the gratitude of his patient for his fee is like the traveler who waited on the bank of a river until it finished flowing, so that he might cross to the other side. (8) Modesty, simplicity, truthfulness!—cleansing virtues, everywhere but at the bedside; there simplicity is construed as *hesitation*, modesty as *want of confidence*, truth as *impoliteness*. (9) To keep within the limits of a dignified assurance without falling into the ridiculous vauntings of the boaster constitutes the supreme talent of the physician. (10) Remember always to appear to be doing something—above all, when you are doing nothing. (11) With equal, and even inferior talent, the cleanly and genteelly dressed physician has a great advantage over the untidy one.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

On the occasion of its tenth anniversary the Odontological Society of Pennsylvania will hold a two days' session, commencing at 2 o'clock on Wednesday, December 12th. The programme will consist of addresses and essays upon subjects pertaining to dentistry, which will be especially prepared for the occasion by leading members of the profession. A series of clinical demonstrations will also be given by a number of gentlemen having new features to present relating to special methods of dental practice.

An interesting exhibit will also be made by dealers in and manufacturers of dental goods, who will be afforded an ample opportunity to show the latest improvements in their respective lines.

The committee having the matter in charge have determined to make the occasion a notable one, and no pains will be spared to render the meeting interesting and attractive. A general invitation is hereby extended to the dental profession to meet with us and take part in the exercises and discussion of papers. The programme will be issued at an early date.

H. C. REGISTER,
Chairman Anniversary Committee.

THE price of Dr. Wardwell's very useful corrugated rubber foot pad for the tread on dental engines has been reduced from \$1.50 to \$1.00 each. We are sure that at this moderate price no dentist can find excuse to do without it. Those who have used them say that they would not be without them for any price.—ED.

A COLLAPSED DRUGGIST.

"I want some concentrated lye," he slowly announced, as he entered the store.

"You mean concentrated lye," suggested the druggist, as he suppressed a smile.

"Well, maybe I do. It does not make any difference. It's what I want, anyhow. What does it sulphur?"

"Eighteen cents a can."

"Then you can give me a can."

"I never cinnamen who thought himself as witty as you do," said the druggist, in a gingerly manner, feeling called upon to do a little punning himself.

"Well, that's not bad, either," replied the customer, with a sympathetic glance. "I ammonia only a novice at the business, though I've said good many puns that other punsters reaped the credit of. However, I don't care a rappee far as I am concerned, though they ought to be hanged without delay all those wouldn't know what was the matter with them. Perhaps I shouldn't jest—myrrh. We had a pleasant time, and I shall say—"

It was too much for the druggist. He collapsed—*Dearest Five F'm.*

RESOLUTIONS PASSED AT THE AMERICAN DENTAL ASSOCIATION, - Resolutions offered by Dr. Marshall, Chicago.

Whereas, It is the sense and belief of the American and Southern Dental Associations, in joint meeting assembled, that the use of impaired dental and surgical goods works a hardship upon the profession and the public; therefore, be it

Resolved, That we memorialize Congress to abolish all duties upon impaired dental and surgical instruments, apparatus and supplies.

Resolved, That the secretaries of the Associations be instructed to forward these resolutions to the proper authorities in Congress and that each member of the Association be requested to use his influence with the Congressmen of his district to vote to place the above-mentioned goods upon the free list.

The Twenty-sixth Annual Meeting of the New England Dental Society will be held in Boston, Thursday and Friday, November 14 and 15, 1895. An interesting program has been arranged by the Executive Committee. Mark off the days now from your appointment book, and be sure and be with us.

Yours, etc.,

A. H. ORRIS, Secretary.

The Twenty-fifth Annual Meeting of the Connecticut Valley Dental Society will be held at Springfield, Mass., December 6 and 7, 1895.

GEORGE A. MAXFIELD, D.D.S., Secretary.

Holyoke, Mass.

If there are any of our subscribers who are suffering from dyspepsia, and who feel the need of some form of tonic, we now most cordially recommend "Golden's Liquid Beef Tonic." It is easily digested and forms a very palatable and beneficial preparation.

A NEW ANTISEPTIC SOAP.

Until quite recently a satisfactory soap containing as an antiseptic one of the salts of mercury, has been difficult to prepare on account of the alkaline soap refusing to yield a good lather, oleate of mercury being formed—a compound which has little or no germicidal action. One of the most powerful of the mercury salts is, as is well known, the bichloride. Moreover, it is cheap and easily soluble, but it has the disadvantage of being extremely poisonous and easily reduced by albuminoid matter, with which it combines, thus being rendered inactive. In a paper recently read before the Society of Chemical Industry, by John Thomson, the solubility of the red biniodide of mercury (which is claimed to be even a more powerful antiseptic than the bichloride) in iodide of potassium has been made use of. A soap can thus be easily prepared containing a certain proportion of the biniodide in a soluble form. It is stated to be permanent, having no tendency to separate, and to be more germicidal in its properties than any other antiseptic soap yet known. Experiments were made to demonstrate this. In experiments carried out in the same manner with other antiseptic and ordinary soaps, it was shown that the growth of the organisms in many cases was not prevented. The importance of such a soap in medical and sanitary science is very obvious. The biniodide soap has been used in the treatment of eczema with well-marked success, especially where the irritation is due to the fermentation of accumulated secretions, the fermentation being set up by micro-organisms. It has also met with similar success when used in parasitic skin diseases, such as favus and ringworm. As a parasiticide, too, the importance of its application to patients during the period of desquamation in scarlet fever is evident.—*Lancet*.

LIQUEFIED CHLORIDE OF METHYL AS A LOCAL ANÆSTHETIC.

At a recent meeting of the Société de Biologie, M. Gallippe (*Bulletin Médical*, No. xi, 1888) stated that for the last two years he had been employing liquefied chloride of methyl, dissolved in ether, by means of a hair pencil or a medicine-dropper, as a local anæsthetic, with the best results. By its aid he has been able to practice section of urethral strictures, open abscesses, incise the skin, and even draw teeth, without the experience of the least pain by the patient. In the latter case the only difficulty is experienced in the extraction of the last molars of the upper and lower jaws. Sometimes he has found sloughing of the mucous membrane to follow as the result of the application of the chloride of methyl; but this is rarely the case, and when it does occur is but superficial. In acute periostitis the application of chloride of methyl is often painful by implicating the neighboring teeth, and the anæsthesia is obtained with difficulty; but nevertheless the pain of the extraction of the teeth is greatly reduced. He has also employed it in opening alveolar abscesses and in various operations within the mouth. Finally, he claims that the hemorrhage, which is often troublesome after the extraction of teeth or operations upon the mouth, is really controlled by the application of liquefied chloride of methyl.—*Therapeutic Gazette*.

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NOTE.—No paper published or to be published in another journal will be accepted for this department. All papers must be in the hands of the Editor before the first day of the month preceding that in which they are expected to appear. Extra copies will be furnished to each contributor of an accepted original article, and reprints, in pamphlet form, may be had at the cost of the paper, press-work and binding, if ordered when the manuscript is forwarded. The Editor and Publishers are not responsible for the opinions expressed by contributors. The Journal is issued promptly, on the first day of each month.

Original Communications.

PROFESSIONAL PATENTS.

BY S. HOLLY SMITH, BALTIMORE.

READ AT THE EIGHTEENTH ANNUAL MEETING OF THE NEW JERSEY STATE DENTAL SOCIETY, HELD AT MOUNT PLEASANT, JUNE 18, 19, 20, 1888.

Of all the questions which we have need to discuss impartially and decide wisely, there are probably none commanding in importance the question, "Should a dentist patent his inventions?" It is not a question, probably, the discussion of which, either one way or the other, will seriously impede or affect the material prosperity and progress of the profession. In this dawn of the 19th century, the spirit of scientific investigation is so rife and so wide awake, that a question of patents or no patents in any given calling is not apt to stay its inquiries or lessen the number or magnitude of its discoveries.

Neither dearth nor plenty of patents can stifle science; for science and scientific thought were before patents, and will be after they

have faded from the earth, if ever that unpractical and un-American period comes.

The foundation of dentistry is laid broad and deep in the supporting substructure of scientific principles. But strange as it may appear in this age of a regal and imperial materialism, there is another standpoint from which we must view our profession and from which we must judge what is to its best interests, what best comports with its true elevation, and that we may say is the ethical standpoint. It is well for us that we can come to the discussion of this question in the peculiarly favorable circumstances of our times and surroundings—with the examples of older professions to guide us, and the free thought of younger minds ready to give potent arguments for new courses—with the experience and judgment of an older order of things, and the ardor and courage of youth and its attendant spirit of audacity, innovation and investigation. A judicious mingling of these elements of conservatism and desire for change should set us aright in our discussion and decision of this great and interesting question. First, then, let us review briefly the example and experience of medicine in this matter; examining at the same time, if we can, the reasons at the base of its course, and the effect of such a course on the progress of medicine.

The position of medicine is flatly opposed to patents among the members of its profession, and medical ethics brands it as an unprofessional action for anyone bearing an M.D. after his name to take out a patent for a medical or surgical invention. To those of us who so strictly insist on recognition as a branch of that noble and time-honored profession, it seems this should be an all sufficient reason for a similar decision on our part. Those who become members of a family or society by birth or by adoption cannot expect to alter its established traditions and laws, while composing but a small part of its body politic in numbers or influence. They must therefore accept the régime under which they have been received, until their weight and influence are sufficient to change it; and to all dentists who rejoice in their kinship to the noble science of medicine I would say whether you have taken up medicine or medicine has taken up you; in either case, the ethics of your profession must be the ethics of medicine. Your claim, if there be any among you who have such a claim, to the warrantableness of patents in your

profession, is summarily dismissed by a reference to the code by whose principles you must be governed or to whose practices you must prove recalcitrant.

But many of us are not content with so large a use of authority and so small an argument. The desire exists that reasons be submitted to fair and candid judgments, untrammelled, if possible, by prejudice, uninfluenced by that pride of position which accepts professional traditions with unthinking submission. To such we think a strong appeal can be made, which the franker and better natures will not cast away unheeded. The first reason for which I think it unprofessional for dentists to patronise their occupations is based on a view of the position which our profession occupies towards the rest of mankind, as a dispenser of blessings and comforts to all who come under its enlightened and beneficent healing powers. A high conception of the mission of our profession is not only important in the discussion of all questions pertaining to it, but must be the essential element of that discussion, its soul and vitality, else the poverty of degeneration will encounter us with the festering putridness of professional degradation, charlatanism and quackery. With the most settled conviction we hold the belief that our mission is among the noblest of all professions; and if this belief be deception, I do not desire to be undeceived; but will discuss the question from this vantage-ground. Shall we be told that the profession to which we have given the ardor of youth, the maturity of manhood, and to which we hope to add the experience of age, with fervor, constancy, and consistency—that we regard it in no higher light than the corner of our brain; no higher than the donkey to toil before the cart of self-profit, whose hide and bones we would be glad to sell when he can no longer work on. Shall it be said that we practise dentistry solely for what we can get out of it?

This is what is called a practical age, and I may be talking to practical men, men who gauge their success by the number of figures in their bank balance; but I refuse to credit, whenever announced the statement that the men of our profession would so mistreat and so misconceive the mission of dentistry as to deal with her solely as the channel through which our dollars are to run from the great public to the individual practitioner, in which main-pipe each professional brother would open his little side pipe and

by dint of scooping and scratching from the main and from his brothers' ducats strive to increase his pile. If, then, our mission as professional men does not have money getting for its sole aim; if it is our desire and purpose to alleviate the sufferings and promote the health and happiness of the human race, we should certainly take the humanitarian view and enrich the profession by the result of our labors, extend its sphere of usefulness and honor, learn that the advancement of the profession is more than the profit of the individual, and be content with that honor which dentistry hastens to pay her brainy and unselfish sons. If my brother has been fortunate enough to make a discovery by which the pain of thousands may be lessened, why should he not rejoice to make known his discovery to his thousands of brethren that the dominion of misery and disease may be abridged? Why does he withhold his benefit with suspicious eye and reluctant hand in order to reap a handsome profit from pain ridden humanity? And yet my brother would fain acquit himself of the monstrous charge of trading in human suffering. He would evade the issue by calling on his brother dentists to pay him for the product of his brains, forgetting that the increased cash of his bonus on his patented invention does not fall on that professional brother, but on the ultimate beneficiary.

All that is known to the profession my brother has the advantage of. Does he refuse to contribute his share to that knowledge and practice which enable that profession to accomplish its mission more readily and effectively? Does he cavil amid the sighs and groans of an afflicted humanity about the price he has paid for his professional knowledge? Can he ever form a cash estimate of the value of those services which the unrewarded and unthanked philosophers, the pioneers, the explorers and subjugators of science have given to truth, to investigation and to him?

We have been told that our superiority of vocation is assumed. That no services can be performed for mankind for which it cannot and does not desire to pay. That all men in this peculiar respect are equal before God, all are kings; but we confess that we see no kingly attribute in this indecent clamor, not for honor, not for glory or renown, but for pelf. Kingliness and munificence, royalty and honor, regal plenty and abundant gifts. We have associated; but to haggle and chaffer for prices and payments: these are not the acts of nature's monarchs.

There are few of us who have not desired at least some of the blessings of charity and of love; few who have not willingly performed services for which the only compensation could be the proud consciousness of the good done. Enlarge such a sphere of usefulness and let the thought that it is not rare or a few to whom the beneficence of your labor goes, but to the human race, wherever dentistry is practiced; and if that thought does not possess a supreme exaltation and a grandeur for you, your faith in the brotherhood of man is truly weak. Still, to some such a reward may be too intangible. The faculty, which can gather and enjoy the ever stimulating interest of disinterestedness, may be lacking in them. To these I would say it is your duty to use and not to abuse the position which you have not acquired yourself, but which, under God, your profession has given you; and all you do for your fellow men is increasing that profession's general effectiveness and power is concentrated work.

The legitimate, honorable and professional practice of dentistry has brought affluence to some and a livelihood to all who have united ability and application. Yet I do not think there is a man among us who would not forego the just reward of his labor rather than do aught to retard the development of our calling. I will go a step further, and say that the thought that he is adding something to the profession and seeking to project it along its destined course of usefulness and honor would recompense any true dentist for a slighter return for his professional toil and exertions.

Yet does the gift of an invention to the profession make the inventor poor? Only in the negative sense, that it has made mankind more comfortable, added another agency to his profession's powers for work and relief, and augmented his professional brother's equipment. The inventor is no whit poorer; but the world and the profession are richer.

After all, just as humanity is greater than the profession, so is the profession greater than its individual practitioner. It represents the aggregate of the knowledge and skill which forms the equipment of its members. It embodies the science and research whenever and wherever made, which render that knowledge and skill possible. It has seized upon and assimilated, with no rivalry, to those patient investigators to whom the truths of nature have

been revealed, the results and conclusions of those revelations by mere virtue of its kingly office as healer and curer. The normal function of each member of the profession is to help augment its knowledge and increase its skill. In soberness and truth he should remember that he gets much and gives little. What we want to-day is the scientific spirit—the spirit which, like Chaucer's noble student, will gladly learn and gladly teach. The spirit which inquires, investigates, invents, discovers and scatters the results broadcast to the world; the spirit which has done more for dentistry as a daughter and descendant of science than all the selfish stimulus of patents ever will or ever can do. Can those who patent their inventions in a profession be said to possess this spirit? They lack its essence and vitality. Not only do they not add to the sum total of professional knowledge, but they subtract from it by stunting and dwarfing its more general growth. Just as patent medicines have made it possible for quackery and charlatan-ism to thrive, so will patent dentistry foster stagnation among dental professional activities. The weaker brethren, instead of either becoming stronger or going to the wall, as they ought, will hang on to reflect discredit upon dentistry by a lame manipulation of labor-saving patents. For the progress of any profession depends more on the thorough study of that science which lies at its base than on a helpless and impotent reliance on toil-saving contrivances, alike enervating to the invention and energy of the poor dependents. If it be said that the free gift of inventions will produce a yet greater degree of enervation and lassitude, I respond no. Patents stifle general exercise of professional inventive genius, not because of the invention, but because of the patent. It becomes the policy of a successful and powerful business to push its patents to the supplanting of other inventions—a few whales swallow all the rest of the finny tribe, and the very device looked upon to foster and encourage inventive talent has the opposite effect. *

Have surgical devices been fewer, and have other branches than dental surgery suffered by the exclusion of the patent system from their practice? Free discussion, candid criticism, and unpaid, well-merited praise have served the student in surgery well. The medical and scientific world are looking with impartial eyes upon his efforts. What he does that is good is approved and adopted; while with the approval there is a flavor of brought-up

opinions, no smack of a well-disguised advertising scheme; but the frank judgment of a brother student, who has learned something in his chosen work, and is thankful for inspiration and strength. If in the business and trade world the extreme and only stimulus be selfishness and a hankering after the slightest dollar, it were surely next to crime to introduce so squalidly, and thrust a penny into a profession.

Are we not our society whose courtship aim among ourselves is to help each other, or does each regard the other as his legitimate prey, upon whom to work off his little scheme, or in whom to sell his little patent? I know I need not hesitate for an answer to such questions in this body of men. The *esprit de corps* is as strong in dentistry as in the other learned professions, and will stand a yet greater strain than the patent system so long as the *personnel* of her membership find so unalloyedly the honorable promptings of gentlemen and of brethren.

We have seen, then, that the experience and practice of the older profession proper is unqualifiedly against patents by its members, and that some of the reasons for this opposition are: From the position—a branch of the great healing art—occupies towards the world, having in its elevated and noble mission a real, and not an assumed, superiority of vocation; from the lack of harmony which the patent system in a profession exhibits with the true spirit of scientific investigation and inquiry; its tendency to stunt and dwarf the standard of eminent professional attainments, and to substitute for those requirements an easy-going exclusivism and a miserable quackery; the suggestion of professional methods and business by business habits and economy; the submission to trade theories and trade valuations of services and requirements which are not the subject of trade. We have seen that the stimulus which it offers is at best purely material, selfish and mercenary; that it cannot be reconciled with a refined and elevated *esprit de corps*, but concurs with the unethic, devilish, and himself policy of the mercantile world, with its unscrupulous sufficient to plaster the globe over, its love of monopoly, and its hundreds of thousands of iron-jawed tyrannies.

What are the arguments of those who support the patent system? They are excellently stated by Dr. W. Storer Holt, of the S. S. White Dental Manufacturing Company, of Philadelphia,

in a paper read before the Mississippi Valley Dental Association, in March of the present year. This paper is certainly well-written, nor can we think that better arguments, better put, can be produced for that side. It would seem, however, from our point of view, that the discussion is cast in a low key. The pro-patent advocates are no sooner in the field than they make a bee-line for their legal bulwarks, and set up a vigorous outcry about the protection afforded their property in all the courts, both of law and of equity. Thus, at the outset, they shift the ground of contest, and evade the point at issue, which is as to its being professional or not for a dentist to patent his inventions.

The position of the pro-patent upholders, in a legal point of view, is impregnable. We shall not attempt to assail it. We certainly know that a patent is property, and that the law protects a man in the enjoyment of his property. Our friends have ably defended a point about which there has never been the slightest dispute, and though they have wasted much ammunition under the impression that they were about to be assailed, they have done themselves the credit of showing considerable legal lore and forensic acumen.

Why should a dentist go into a convention of dentists in a discussion like this and talk about the law of the patent system? Have we either to make or construe the law on that or on other points when the law touches us? Is not this matter troublesome enough as it is, without any legal complexities?

We grant all they demand as to property right and court protection. What then? The question we argue and the principle we contend for is to be settled right here among ourselves. Patent-rights, "the most unassailable rights to property on earth," will not take to themselves wings and fly away if it should happen to be a settled conviction in the minds of the weight of the dental profession that patents are unprofessional. So let us discuss the question here from a professional standpoint, in an amiable, dignified manner, and leave to the legal luminaries, truth-twisters and pettifoggers the drawing of nice distinctions between truth and falsehood, theft and profit, etc.

If the pro-patentees had continued their researches through the antiquated and fanciful Blackstone to the modern and philosophic Austen, they would have discovered that the law does not regard

the ethical quality of the action is *passed over*. His sole inquiry is: Have any published or established duties been violated? When that proposition has been legally proved punishment follows; when not legally proved, acquittal is the result. Now, as the sole points at issue are the moral and ethical qualities of the discussed course of conduct, we cannot see that the law which would punish our brothers in court can have even the slightest weight here, when it omits the issue itself.

If there is one thing that exceeds the pro-paleontologists' deep sense of security behind his legal fastnesses, it is his admiration for business methods, business morals and business ethics. These combined form a code of Spartan simplicity, whose first commandment is, "Get all you can," and the second, "Keep all you get." Most of us have experienced the elevation of business methods; but how this outburst of enthusiastic wonder by the pro-paleontologists before mentioned, Dr. How:

"There is among men no higher working standard of honor than that of the business man, whose simple statement or working formula is: 'I will sell this to-day for so much;' and when his fellow-merchant, at hand or a thousand miles away, replies, 'I will take it at your price,' that practically completes the transaction."

As to this standard of honor, we have only to say that, in addition to the truly Christian spirit of forbearance which these merchants manifest in not lying to each other, there remains the cold, hard fact that a contract exists between them, which, honor or no honor, the somewhat firm and compulsion-giving of the law will enforce, or punish the breach thereof. We see how slippery a customer our business man must be, that his simplest agreements in a business way are thus hedged about and enforced by this cold, unemotional body of law.

The standard is a pretty one: not below that of any honest man, and recommended at once by honesty and policy. We are led to suppose that there must be some reason for this legal support of the standard, and that some business men at least do not measure up to it with moral exactness. However well the standard may do to buy and to sell by, it can be of no use to us at present; and it pitches the key of discussion yet lower than the legal standard by which it has to be bolstered up. We cannot and will not assume that there is naught in our profession save what may be bought and

sold—and if we ever do adopt the motto of Charles I, that “Every man has his price,” I trust with splendid folly we shall prefer even empty honors, such as the gratitude of humanity, the esteem and reverence of our professional brethren, as the price paid us for our inventions and brain-products, rather than with business-like instinct to sell for hard cash not only our professional services, but our sense of honor.

Not only are the tests by which our patenting brethren would decide the professional quality of their action unfit criteria, but the motives which they impute to all who oppose the patent system are singularly sordid and impure. They not only simply but openly assert that all the talk about professional honor is naught but the high flown courtesy of a highwayman. A subterfuge which would enable the poor patentee to be robbed of the result of his labors, that the pockets of his brother dentists might be lined. In other words our pro-patent friends deliberately close their eyes in this debate to every view of the subject except the narrowest and most selfish. Having openly avowed their principal defense to be the legal right which they have to their property, having utterly ignored the claim of humanity and the profession, having set up the principle of barter as the basis of their conduct, they go yet one step further and declare that all who dare adopt any other basis, do so because at their heart they are thieves and robbers.

As the patent law is their mainstay, so professional honor is their great bugbear, which, since they cannot comprehend, they invest with qualities too foul to contemplate, bitterly bemoaning the sacrifices which it exacts, and the depredations which it commits. We must say to our friends, however much we may deprecate the injustice of such dishonorable imputations, we must and will still recognize that there does yet exist such a thing as professional honor. The crown and ornament of our vocation. Does the sun cease to shine because an owl more or less cannot see it? We desire to conclude what we have to say on this subject with an appeal against a too great yielding to the encroachments of the materialistic tendencies of our times. Here everywhere its power is felt, but we cannot and will not believe that there are influences and impulses which cannot be treated as things to be coldly analyzed and scientifically dealt with as materials subject to material laws, and material manipulations. And these make life worth living and

make men more than splendid and complex machinery. And as these we look with confident expectation and proud hope for the preservation and elevation of professional purity, professional courtesy and professional honor.

IMMEDIATE FILLING OF ROOT CANALS.

BY W. H. JONES, D.D., D.M.D., DENTIST.

READ AT THE OCTOBER MEETING OF THE AMERICAN ASSOCIATION OF ORAL SURGEONS, CHICAGO.

I have chosen this subject not in order to advocate the immediate filling of all root canals, but in order to discuss the question on both sides, considering the conditions favoring the immediate filling of root canals, and those contra-indicating it. In dealing with this problem, it is necessary that we be guided by sound surgical principles. Though the relation of a tooth to its surrounding tissues is unique, yet the disturbances due to inflammation and abscess must be treated according to the same surgical principle as hold in other parts of the body. I emphasize this point because many seem to work upon the teeth as if they were not vital, and as if they were not subject to the laws governing the rest of the body. The whole question as to whether root canals shall be filled at once or not depends upon the condition of the peridental tissues, and of the root canals. Some of the common conditions requiring root filling are:

1st. An inflamed pulp which must be destroyed and removed. In this condition there has existed, as a rule, an inflammation of the peridental tissues. The removal of the pulp creates a simple wound involving a minute area at the apex of the root. This wound heals quickly by first intention giving rise to no inflammatory products. The conditions are, therefore, favorable for an immediate filling of the root canals. There can be no much difficulty, except in such cases as bleed profusely from the apical artery, thereby rendering the proper drying of the canal impossible.

A second condition requiring root filling is one in which the pulp has died without being exposed to the air, and has given rise to no peridental inflammation. The condition of such pulps commonly escapes notice for a time. When, however, they have been

discovered, it becomes a question whether the pulp cavity should be filled at once, or whether a delay is advisable. It is my experience, and I find it also to be the experience of others, that immediate root filling is not wise under the conditions just described. Though the dead pulp may not have given rise to trouble previous to its having been exposed to the air; yet, when so exposed, it seems to furnish particularly good soil for the growth of putrefactive and suppurative germs. If we were able to remove every particle of such a pulp at one sitting, then it would be wise to fill immediately. We are, however, not sure of so doing, and a small remnant being left is capable of being infected with germs and setting up severe peridental disturbance. The influence of germ life should be borne in mind, as it is probable that no suppurative process occurs without the agency of specific germs. The putrefactive process is likewise due to germs. So long as these organisms are kept from a dead pulp, the pulp creates no disturbance, but, when once admitted, they produce characteristic results. The filling of root canals of the class described above should be delayed till the dead pulp has been thoroughly removed and the canals disinfected. We can know that this result has been obtained when the tooth remains comfortable for a short period, after having been tightly filled with cotton and stopped with gutta-percha.

A third condition requiring root-filling is where the pulp, by its death and decomposition, has started up an inflammation or abscess in the peridental tissues. This condition we treat on true surgical principles when we remove the irritant and establish as free drainage as possible for the products of inflammation. Unfortunately, in inflammation about a tooth we cannot get at the seat of the disturbance so readily as we could desire. We must rely on the small apical foramen offering an outlet for the discharge. To close this outlet before all disturbance has subsided and the discharge has ceased seems to me bad surgery and bad dentistry. It may be said, however, that if in such cases the root-canal be stopped at once, subsequent trouble may be met by approaching the abscess through the outer alveolar plate, thus giving exit to the abscess and gaining access to the apical space for treatment. Is it wise, however, to force an inflammatory affection to burrow about in the bony alveolus and effect a passage outwards? Is it, moreover, wise to make an artificial opening through

the alveolus? If the abscess forces its way outwards, it causes the patient intense pain and produces a considerable destruction of bone. The practice of trephining through the alveolus, and so reaching the seat of the abscess, I do not find to be very generally advised in our dental authorities except where distinct fluctuation can be made out. Making an artificial opening is certainly good surgery if we can be reasonably sure of reaching with the trephine the seat of the abscess, and if we can be sure of not injuring important adjoining tissues.

If one examines the anatomical relation of the dental canal and the tips of the teeth, the intervening space is found to be very small. In trying to reach this intervening space, which is the usual seat of an abscess, we might very easily enter the dental canal and sever the dental nerve or artery. As the lower jaw, the mental nerve which supplies sensation to the chin leaves the dental canal just between the first and second lower bicuspids at a point often involved in abscess about these teeth. In using a trephine at this point there seems to me considerable danger of severing this nerve. But why this discussion with regard to the external opening of abscesses? Because, if we propose to immediately stop root canals before the peridental tissue has become normal we must be prepared to let out the discharge some other way, or else require our patients to endure a considerable amount of pain while the abscess finds its own way out.

I have heard it said of one who practised the immediate filling of root canals that he was very skillful in the use of the alveolar trephine. It seems to me better as a rule to cure the inflammation through the apical foramen rather than to force or make an exit through the alveolus.

A fourth condition to be described is that in which an artificial opening or fistula has already been established at the mouth of a dead pulp and consequent inflammation. Such cases having an exit for products of inflammation independent of the root canals are much easier of treatment than the foregoing. As soon as the root canals can be made clean, they should be filled.

When root canals are to be filled at one sitting the best method seems to me to be as follows: Make free access to the pulp cavity; enlarge not only the entrance to the root canal, but its entire length. For enlarging root canals, drills which run ahead are useful.

Reamers like the Morey drills which follow the canal and cut at the sides are the safest and most useful. Use a large size drill first, then smaller ones in succession. Even these drills should not be forced, but should be gently advanced only so far as they go easily. There are two reasons for enlarging root canals.

1st. It is easier to fill enlarged canals than those of natural size.

2d. The mechanical removal of the dentine adjacent to the pulp is the best way of disinfecting that tissue. It takes time to disinfect root canals by drugs, and we cannot always be sure that the drugs which we apply do their work. If, however, the infected substance is to a large extent removed bodily the health of the remaining dentine is greatly promoted. I am not an advocate of the extensive drilling out of root canals as practised by some. A process which often results in the perforation of the root and leaves broken instruments to give rise to serious trouble. I do, however, believe in the careful enlarging of root canals to remove decomposable or decomposing substances. When root canals are not enlarged, broaches are commonly used in many ways and not without risk. The peridental tissues may be by them infected through uncleanness of the instrument or by forcing up putrifying material.

If root canals are to be filled immediately, great care must be given to small details; an antiseptic condition must as far as possible be established and maintained.

While the enlargement of root canals should be the most important antiseptic measure, yet there may be parts of the root canal not completely reached by this process. Certain drugs are therefore of value. First to be mentioned is peroxide of hydrogen, which has the power of converting decomposing substances into harmless ones. Not being a violent caustic, it does not close the tubuli to the entrance of its medicinal power. Having the property of disengaging bubbles of gas as long as any decomposing substance is left, it affords a correct guide for the duration of its application.

Some time ago I had occasion to extract a tooth which had become thoroughly infected by decomposition; it was really a dead tooth. This I immersed in peroxide of hydrogen for several hours, at the end of which time a complete renovation had taken

place. The tooth, though kept for some time afterwards, never had the slightest odor. I think no other disinfectant would last quite as well. Peroxide of hydrogen should be kept well stoppered in a cold place, the colder the better. Cold condenses the gas and it is less likely to escape. When needed for use a small bottle should be filled. Even with care this drug deteriorates very rapidly; it is especially difficult to keep in the summer time. Other drugs are of value, such as alcohol, which is a detergent and dryer, cresol-acid 5 per cent. and corrosive soda 1-1000, both of which have very powerful germicides.

IMPLANTATION.

C. CUTLER SMITH, D.D.S., N. Y.

My attention was first called with special interest to the new and astonishing method of implanting teeth about two years ago. After a careful examination of the subject, I was emboldened to enter upon its practice myself. Since last October I have performed the operation of implantation twelve times, and I take great pleasure in reporting that in every instance the results so far as developed have been entirely satisfactory. Care was taken to follow the methods of the best operators, and every precaution was used to preserve antiseptic conditions. In the selection and preparation of the teeth used painstaking attention should be given to every detail, in order that the process of healing may easily and promptly be accomplished. The operation itself is properly in the line of surgery, and naturally requires a thorough knowledge of the subject in hand.

In all my operations the staple has been used, and the result has been that every tooth implanted has been retained firmly in its place, while unfavorable symptoms have not appeared. While this report extends over a period of less than a year, yet my experience confirms the conviction I had previously reached that implantation can be made permanently beneficial. In the cases under my care all patients have had complete use of the new denture, almost entirely unattended by pain or inconvenience. Implantation, if its future is what it to-day promises to be, will become one of the grandest and most beneficent features of dentistry.

The first dentists extracted teeth; next came those who repaired and saved diseased teeth, or replaced them by artificial ones. The third step was the introduction of crown work, in which the root is saved; and of bridge-work, in which two roots are made to do the work of three or more. Is it not reasonable to assume that the next higher step has been attained in implantation, where the diseased tooth is replaced by a sound one, which takes its place as if it has been an own child, and not an adopted member of the family?

My own faith in the permanent success of this new method is strong, and I trust that, after a suitable period has elapsed, I shall be able to report the continued success which has thus far followed the implantations I have undertaken. The mere fact that unfavorable symptoms have not appeared after the lapse of several months is in itself a promise that the results will be permanently beneficent.

A patient who has the use of the new teeth even for a period of not longer than two or three years would be well repaid, but the experience thus far recorded indicates that where operations have been performed, after due care has been taken in respect to the conditions of the patient, and the selection of suitable teeth, and with needful and antiseptic precautions, implantation is permanent. When this is fully established by the lapse of time, dental science will have been shown to have taken one of the mightiest strides in its history.

Implantation has already proved a benefit to the profession, and a boon to suffering and disfigured faces. It has stimulated the best minds in the profession to discover methods for establishing the permanency of the new operation, and it has already had important results in elevating and broadening the scope of our work.

HOMŒOPATHIC THERAPEUTICS IN DENTAL PATHOLOGY.

BY W. IRVING THAYER, D. D. S., M. D., BROOKLYN, N. Y.

Read before the New Jersey State Dental Society, Asbury Park, N. J., July 18, 1888.

Homœopathic therapeutics does not consist in the dilution or size of the dose; but "the healing power of medicine rests upon its faculty of producing symptoms *similar* to the disease and superior to it in strength; so that each individual case of disease is

most certainly, fundamentally and rapidly extinguished and cancelled by a drug which is more potent than the disease, and capable of producing in the body symptoms most similar to and completely resembling the totality of those of the disease;" be it by the action of a drachm of the crude drug or by the one-thousandth centesimal trituration.

The nearer one selects a drug whose pathogenesis corresponds to the totality of symptoms found objectively and subjectively in the patient, the higher can he run up his remedy and the quicker will he obtain curative results.

The pathogenesis of a drug is the symptoms that will be noted by a well person who takes the crude drug, or some one of its triturations or dilutions, for a series of hours, days or weeks.

A continuous proving of sugar, chloride of sodium, starch or pepper—all articles of food—will produce certain pathological symptoms. If, then, such simple substances will produce abnormal symptoms, what shall be the result of a continued proving of arsenite, arsenic, belladonna, animum, bryonia, crotonum, china, croton tiglium, eupatorium perfoliatum, ferrum, iodium, iperica, croton, croton sote, mercurius corrosivus or bichloride of mercury, wax, resins, phosphorus, platina, sepia, spongia, silica, sulphur, tellurium, plumbago, thuja and zinc, to say nothing of the many dozens of other remedies?

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I am quite well aware, that the rule amongst the profession is, when a practitioner finds a pulp that has long been exposed, to proceed to devitalize that pulp. That this may be the best possible method of procedure, for some pulps will hardly admit of a doubt. But under other conditions I should consider it against the best interest of the patient to destroy that pulp.

Two things are so patent as the noon-day sun; the one is that the Almighty created that pulp for specific purposes; the other is that the patient, by his neglect, has done his best to defeat the purposes of his Creator.

The question now arises: What shall the party of the (small) part do in the premises? According to the *humble intelligence* of the writer, if compelled by this high court to answer the question, he would say, save that pulp alive if possible! Other practitioners of greater experience would advise to destroy the pulp

every time. If asked why they would so proceed, their answer would be because, sooner or later, say in a year or two, that pulp will surely die! Yes, indeed! "it is appointed unto man once to die, and after that the judgment."

Should a patient come to me with an exposed pulp that had long given him trouble, with severe congestion and a throbbing and beating pain; he desires to save that tooth; and if the cavity is so arranged that I can get a good view of the pulp, horns and all, I save that pulp alive. I have yet to see a tooth with a live and healthy pulp, with an alveolar abscess on its fang, or tendency thereto. I have yet to see a tooth, black, dried and brittle, that has a live and healthy pulp. These are some of reasons for objecting to destroy a living pulp.

It appears to be a very lame and poor argument for me to say, "I always kill exposed pulps, because sooner or later they will die, and nine times out of ten, one will have a putrescent nerve and alveolar abscess to deal with." This may be the sad experience of some gentlemen; but with me it has been different.

It is not claimed that every pulp can be saved, but the large majority can be.

It is no trouble for one to save a freshly exposed pulp that has been exposed by the burr. The reason for this is that there is no acute or chronic inflammation. Dress with carbolic acid, creosote, or the bichloride of mercury to provide against the microbes; then gently cover the exposed portions with oxyphosphate; gently, without pressure. A freshly exposed pulp will tolerate *gentle* contact, but will always rebel against pressure; but, in cases where there is or where there has been acute or chronic pulpitis, or any inflammation, no pulp that has ever come within the superintendence of your speaker will permit even gentle contact, to say nothing of pressure.

Provisions against contact and pressure are two of the most important matters to be attended to in saving exposed pulps, especially those that have been once inflamed.

It is readily understood that it would be the height of folly for one to proceed to cap a nerve while there was any inflammation and without making the parts thoroughly aseptic.

Should I find any inflammation or slumbering irritation, I should, for all acute symptoms, depend on aconite, third centesimal,

three drops in a half of a tumbler of water, two or three times at a dose once in an hour from two to five or six hours, and then every two to three hours, as I found the case progress. Do not crowd the remedy too fast, or you will produce an aggravation of your symptoms. Always lengthen the time between your doses as the symptoms become less urgent. If one has reason to believe that suppuration is threatening, exhibit mercurial ointment as about the third antiseptical titration every three hours for a few times. *Mercurius corrosivus* is a remedy that has been used for a long time by the homœopathic physicians to prevent suppuration.

I need hardly remind you that our new antiseptic, viz. the chloride of mercury and mercurius corrosivus, are identically the same drug. The former is used to kill the microbe, and the latter is administered constitutionally to protect the microbe from forming pus. If one is legitimate, the other, certainly, is reasonable. Thus, again, we find the microbes publishing the capital trade, and confirming again that there is one law of cure.

One will not aggravate pulpitis by very light topical applications of a suitable dressing when the pulp is exposed to the air. It is when the original cavity of decay is stopped up tightly that a once inflamed pulp will not permit contact and recovery. It is safe to cap and fill only when there is no pulpitis!

But, sometimes pulpitis re-appears some months after the practitioner has completed his operations, on account of thermal change or other exciting cause. If let alone, and only a palliative treatment is adopted, such as topical applications of acetate to the gums and counter irritation with caustics or iodine, the case will surely go on to suppuration, and the misery of exposing exposed nerves be condemned.

In such cases the pain and discomfort arises from an undue accumulation of blood in all the pericycles of the pulp; and there is pressure upon the nerve filaments and pain. The capillaries have dilated and allowed the blood to engorge itself within their minute canals, and they are incapable of contracting upon their contents, or the bony dentine walls to accommodate that expansion of the whole pulp tissue; and, unless relieved, we shall have want of function, death and pus.

Now, what is to be done? Simply to make the arterioles contract upon their contents and expel the static blood. How can

this be done? By giving a remedy that will cause just such a condition as we find in the frog's foot, and here we will find that homœopathic therapeutics can have an advantageous position in dental pathology.

It should be remembered that aconite's most useful position is in the primary symptoms, and not after an exudation of lymph. Mercury is the remedy then; but many times, if too much procrastination has been practiced by the patient, and organized lymph begun to form, nothing but death of the parts and suppuration will be the result.

To resuscitate a drowning man, one must immediately begin artificial respiration, and not wait three or four days to consider the subject. To treat successfully congested pulps, one must begin early.

Those persons who have had exposed nerves capped should be instructed to report early, as soon as the first symptoms show themselves, when, nine times out of ten, a few doses of the third dilution of aconite will completely stop all farther progress of the disease.

A cap must be constructed which is so much concaved that should a little swelling of the pulp in its grief ever occur, it will have room enough to enlarge until you can reduce its size by aconite, belladonna or gelsiminum.

Caps made of beaten silver or gold, no thicker than writing paper, made concave by a punch on a piece of lead or wood by a broken excavator, have served your speaker very satisfactorily. The cap should rest beyond the horns of the pulp, and on solid ground, where no softened dentine can give way and precipitate a pressure.

I will close by calling your attention to one more remedy—the extract of *Hamamelis Virginica*, for the venous congestion of the gums, after the extraction of the teeth. This extract is highly curative, and will serve a much better purpose than any other mouth-wash with which we are acquainted.

Thus, gentlemen, we have endeavored to prove to you that there is a law of cure, and that homœopathic therapeutics is a valuable aid in dental pathology.

Reports of Society Meetings.**NEW JERSEY STATE DENTAL SOCIETY.**

JUNE, 1888.

ESPECIALLY REPORTED FOR THE IMPROVEMENT PRACTITIONERS.

DISCUSSION ON DR. B. HOLLY SMITH'S PAPER ON "PROFESSIONAL PATENTS."

Dr. Leary—I especially like the last part of the paper, showing what wonderful things inventors have done for this universe. Any person who makes an invention must give his time and his money to it, and should be paid for his invention in order to get back what he has spent upon it. A dentist is protected in his work more than is the man who takes his patent in the Patent Office at Washington, and to consider it unprofessional conduct for a dentist to try to get back his outlay on an invention is wrong. Here in America we are protected as no other nation is protected. And it is by this protection that we thrive. S. S. White was a man that we should be proud of. If it were not for him you would not have the beautiful instruments that you have to-day to do your work, and when you buy those of the firm he established you get your full money value. He was at one time a dentist, and in this other branch of his calling he saw a profit for himself and his professional brothers as well, and he went into it and made a success of it.

I have just noticed a statement in one of the papers that J. H. Lippincott, of Pittsburgh and New York, has paid about a million dollars for a patent. Edison had sold one invention for a million of dollars. No doubt if Dr. Brown could patent an invention and get a million of dollars for it, he would accept the money with thanks.

Dr. Allinson—Whenever this question comes up, there is with a manifest dearth of evidence that either side have grasped fully the foundation principles involved, that it is almost useless to attempt to speak to the benefit of listeners. The great difficulty is that they do not distinguish between law and legislation, between the eternal verities and the measures which legislators must in govern the commercial aspect of our lives. The whole patent system is robbery from the beginning to the end; and every inventor, with the exception of a few, has been robbed by the commercial spirit of the men who get control of the invention. Are we men enough to be fair? is the question.

The very fact that we have to eat something that has just died is a serious question. The bread and butter question is horrible to contemplate. And the bread and butter question being based upon financial advantage, who is entitled to the advantage? When we graduate a man, he is entitled to all the rights, privileges and immunities belonging to the grade which he has attained. Iniquity is at the bottom of the whole of it? What right have we to any rights that are not right at all?

Dr. Hayhurst—Perhaps, looking a little beyond the narrow bounds of the profession, which embraces only a small proportion of mankind, the mention of the greatest evil in the world to-day is contained in the expression of the big fish eating up the little fish. It is not only in the profession, but in the world at large everywhere, this great eternal grasping for something more than you have got. It is exemplified in the great monopolies of our country, in the railroad system, in the telegraph system and in the trusts, combining to appropriate everything that is good. And this patent system has been reduced to the level. As has been observed it is very seldom that the man whose brain was fertile enough to make an invention received the benefit of it; but it goes into the maw of these trusts or monopolies which absorb and take all the benefit, and the poor inventor goes penniless and supperless. It is that evil which we have to strike at in the profession, and it was that which this paper endeavored to depict; and so far as its general course is concerned I think it was an admirable paper. In its general trend it is just what we need. If all the human family had that which belonged to them, that which would be beneficial to them, it would be all right; but when the rights of the human family are taken and sold as merchandise and kept away from the masses and any benefit derived from them has to be paid for, it is an evil. You had that evil in the Goodyear patent. I received a circular not long ago with the very same mark as in that case, and signed by the very same man, threatening to prosecute me for putting on Richmond crowns. This is an evil, and it grows out of the patent system. I say that it is the bounden duty of every true man within the bounds of society to set his face like a flint against the extension, the support and the maintenance of this patent system.

Dr. Thayer—The profession of dentistry would not be to-day

what it is if it had not been for the inventive genius of some gentleman in the ranks. You know that is true. Eighteen years ago there came into my possession an instrument that has done more good in this profession than any one instrument that has ever been invented, *viz.* the dental engine. If you perform an operation in dentistry you are entitled to a fair compensation for it, and if you invent some new method of making an operation which costs you time and money, you should protect yourself by taking out a patent. If it is right for a man to earn an honest penny in one way, it is right for him to earn an honest penny in another way.

I think I can speak on this subject without any prejudice, because I never have invented anything. I have not ability to invent anything that would be of benefit to the dental profession, and I have no interest in supporting this side of the subject; but I do believe in throwing aside all this ethical nonsense and giving the man who has the ability to invent something that is valuable his just dues in connection with it. If it is a benefit to the profession they will buy it and use it on their points; if it is of no value they can let it alone. There are a thousand ways in which inventive genius can circumvent it just as Dr. Parr has circumvented the patents in his tooth crowns, and as Dr. Brown has done the same in his porcelain crowns and bridge work.

Dr. Smith—I will say that I agree with the gentleman who spoke last, that dentistry would not be what it is to-day without the inventive genius which has aided it so wonderfully, and I refer in the paper to the benefits received from such inventions. I want to ask you if in surgery or in medicine, where there can be no opportunity for such regard as it is claimed is necessary to stimulate inventive genius, is there any denial of inventions or inventions? What did Flint get for his spine? What did the inventor of the laryngoscope get for his invention? They got credit before the medical profession and before the world at large for having done something, and a great deal, to relieve suffering humanity, and that I claim is a reward. When you say things which to me dogs, you rob us of that which we hold dear to our health, and you would rob the dental profession of that which makes it a profession, and reduce its members to the level of tradesmen.

The subject was here passed.

DISCUSSION OF DR. THAYER'S PAPER.

Dr. Genese—Mr. President and gentlemen, we have, as Dr. Thayer has said, many sceptics in regard to the saving of exposed pulps, and I can only say that I have a record of over two hundred cases of pulp capping within the last ten years, and I was able to say, in a paper read before the New York Odontological Society a short time ago, that some of these teeth, the nerves of which had been capped during the last six years, were to my knowledge still doing good service. The avoidance of pressure in the capping of nerves is of the greatest importance. I do not use any metallic substance in capping nerves; I use a preparation that will, while soft, take the form of the nerve tissue when it is hardening. One of the preparations that Dr. Thayer has mentioned I have had considerable experience with; that is the sulphate of lime. I have very rarely found that to fail in hastening the process of suppuration. I have discarded aconite altogether, for the reason that we get so great an effect from small doses in some patients. In one case I used a very small portion of the diluted tincture of aconite, and the next day I was visited and accused of poisoning the gentleman. I had placed in the cavity a very small portion of aconite on a bit of cotton, yet the effect was so great in a short time that I never could persuade the gentleman that he had not been poisoned.

The cases of sixth year molar exposure of the nerve have been the greatest successes that I have had in capping. The most failures have taken place in cases where the nerve was excised. The principal thing that I have used in combination with capping has been the oxide of zinc mixed with carbonate of lime and cocaine. I will show you that exposed pulps capped with this preparation will be perfectly oblivious to the action of cold or warmth. I think the exclusion of air and pressure in treating exposed nerves before we attempt to fill will preserve a very large number that would be otherwise lost.

Dr. Meeker—I consider myself densely ignorant in regard to homœopathic therapeutics, but I must say that Dr. Thayer's exposition of the homœopathic law of cure has been the best that I have heard.

I have used nearly all the remedies mentioned by Dr. Thayer.

Dr. Ivory—In every case of exposure of a nerve there is a consequent inflammation from various causes, such as the fluids of

the mouth coming in contact with the vasopulpal and sensitive nerve tissue, and the operation of filling a tooth immediately on finding a nerve unrooted is, I think, altogether unsatisfactory and unprofessional; for the reason that when you put in a filling you hermetically seal the cavity with your gold, cement or amalgam, and there is no way for the inflammatory products to escape. But by the use of medicines, such as acetate of iodine or carbolic acid, and leaving it open to the influence of the air—and the air is one of the principal agents in the healing process: if you have a sore on your hand it is necessary for it to have air in order to heal properly—if you treat it in this way the inflammation may subside and the operation of filling be successful. If you put in a filling immediately you do wrong, but if you leave it so that the air can come in contact with the tissue for a few days, and then put in your filling, you will have better results than if you fill at the moment.

Dr. James Truman.—Mr. Chairman, (probably I know as little as any other person present in regard to the action of homoeopathic medicines. I give homoeopathy credit for many good things, one of which is the liberalizing of the old school of medicine, not only in their treatment, but in their use of remedies; but I do not understand the principle of homoeopathy, and I have never been able to understand it so that I could bring it into practice satisfactorily to myself. I also do not understand one assertion which I think the essayist made, that acetic increases the velocity of the circulation, and that he could remove inflammation or purify by its use, through overstimulating the static condition of the blood which necessarily precedes positive inflammation. My view of the action of acetic is that it is a cardiac depressor; that it acts probably through sympathy with the vagus motor nerve, and, while it produces irritation of the vessels, will necessarily slow the action of the blood in those vessels. Therefore I do not understand his view of the matter. He may be correct, but it is not so generally understood. I do not comprehend his assertion that he can save nine-tenths of the exposed pulp by this sort of treatment. My own view of the matter is—as he probably will agree, because he said that freshly exposed pulps would be better treated than those in which inflammation had supervened—that it is hardly possible to save an exposed pulp to the extent that has been recom-

ted by many in the profession and in this paper, except the condition of the teeth is of a certain favorable character. It seems to me unphilosophical to suppose that a pulp in a highly inflamed condition can be capped and its vitality retained. I do not think it can be done except in certain conditions, conditions of great vitality of the individual, exemplified in very dense teeth, and in those cases softening of the teeth precedes the capping. I have seen recently, under the treatment of Dr. Jack, in Phila., a few such cases; the teeth were extraordinarily dense in structure, showing great vitality in the individual. How many cases of this favorable character come into our hands? Those most frequently met with are of an entirely opposite condition, and we have to meet this condition, and not the others, which are comparatively rare.

In regard to homœopathic treatment, I am really glad that the New Jersey State Society is liberal enough to admit a paper upon this subject. I believe in broadening our views by an honest examination into these questions. Certainly homœopathy, as I understand it, is about as foreign to my conception of therapeutic treatment as anything possibly can be; but I always hold myself open to conviction.

Dr. Luckey—Mr. President, there is no occasion for me to rise to say anything on this subject, about which I do not pretend to know much; but I have noticed a very great diversity of opinion among the gentlemen present in regard to their methods of treatment, and in regard to the treatment of pulps generally. And I want to take this occasion to call to order two or three gentlemen who have been talking about nerves here. I am very sensitive about that term. We are dentists; and we treat not only the teeth, but dental pulps—not nerves. The public, and most of the dental profession should be made to understand that we have nothing to do with the treatment of nerves except as a part of the dental pulp.

As to the treatment of them, there seems to be great diversity of opinion, especially between Dr. Genese and Dr. Ivory. Dr. Ivory believes that air should be allowed to come in contact with the pulp. We have been taught that the air is full of microbes; and if anything will start up inflammation in a dental pulp, the admission of air carrying these microbes will do it. Dr. Genese covers his pulps with thymol cocaine, and says the teeth will not respond to thermal changes. I believe that is true. But the ques-

tion is, How does the pulp respond the next day? We know that cocaine will quiet the sensitiveness of soft tissue, but the result is not permanent; and that, unless some non-coagulating substance is interposed between the pulp and the outer air, there will be a response. In treatment of inflamed pulps, Dr. Thayer has tried to lead us to believe that it is possible to save nine out of every ten when they are in a highly inflamed condition. Is that your statement?

Dr. Thayer—That is the statement.

Dr. Lacey—I do not believe it is possible to save two out of ten highly inflamed pulps. Congestion of the pulp causes such an engorgement of those minute capillary vessels as to cause constriction of the pulp at the foramen, and unless the foramen is very large death of the pulp is sure to ensue. You may treat and cap it, and you may keep it quiet, but it does not follow that it is alive. There are cases of congestion where the pulp can be saved; but I think it is a very safe rule to destroy it. When a man says arsenious acid, nor anything of similar nature, shall be used in his office for destroying pulps, he is not only doing injustice to himself, but he is doing injustice to his patient. There are many cases coming to the hands of the practitioner where it is far better for both patient and practitioner to destroy the pulps than to try to save them.

Dr. Thayer—With regard to the remark of the gentleman who said that he did not believe it possible to save the large percentage of pulps that was claimed by your speaker, I think your speaker stated distinctly and positively, that it was highly injurious and very hazardous to attempt to cap a pulp while there was a swelling of pulpitis. Your speaker never caps a pulp while there is the least sign of inflammation. He reduces the inflammation and then caps, and invariably has success. I do not ask you gentlemen to believe me. I know it is a treacherous statement in make, as the subject has been understood by the profession. But I am stating what is true in my practice. I know the experience of the profession is entirely different.

Dr. Stockton—How do you know they are successful?

Dr. Thayer—By seeing my patients frequently afterwards.

Dr. Stockton—Do you cut into the tooth to find whether they are alive or not?

Dr. Thayer—No. If there has been no inflammation or pulpitis it is evident that the pulps are living.

Dr. Genese—The only proof of success is the examination of the cases after a considerable time has elapsed. In all our operations time alone will tell whether they are successful. Dr. Stockton asks the question, has Dr. Thayer or myself examined the capped pulps afterwards to see if they are alive. I can say that I have in very many instances. Like Dr. Thayer, I reduce the inflammation before I attempt to fill the teeth. The cap that I put on can be easily taken off a day or two afterwards and another put in its place. One day a little girl presented herself with a sixth year molar for treatment, and when I attempted to remove the disintegrated tissue the whole mass came away, leaving the pulp exposed so that I could see the pulsation. Here was a typical case to test the method that I had adopted. The child was in great pain and crying. Dr. Knapp was in my office at the time and I invited him to see the child. I showed him that even warm water—cold water was quite out of the question—could not be endured in the mouth at all. I took some of this preparation I have named on a small bit of cotton and applied it immediately over the pulp. The preparation which I use does not give the slightest pain when applied to an exposed pulp; it can be applied to a freshly cut wound without causing pain. In this case when I applied it the pain ceased. The child was allowed to rest a little while, and then water was applied warm, and the temperature of the water gradually reduced until I could apply cold water with a syringe to the pulp without giving the least pain. The effect is obtained by excluding all moisture and air and pressure from the pulp. When the patient comes again the pulp is capped and is allowed to remain in that way for several days until the capping gradually hardens, taking the form of the pulp, before any pressure of filling material is put upon it. I would say to Dr. Truman that I have found less success in teeth of very dense structure than I have with softened dentine.

Dr. Watkins—In answer to Dr. Stockton's question as to whether any teeth that were capped had been opened to ascertain if the pulps were dead or alive, I would say that I have opened such teeth, and instead of finding a beautiful live pulp with a nice formation of new dentine over it, I have found a nasty lot of pus

in the cavity in almost every instance. They have gone on five years, and I have claimed they were grand successes, and I have told this society about the great success I have had in saving exposed pulps, no matter how badly exposed or inflamed they were; but after awhile, when the patient returned for some attention, I would open these teeth, and find a nasty putrescent pulp in almost every case. With me it is almost impossible to save an exposed pulp alive by capping. Dr. Luckey has remarked that he thought two in ten would be a very good percentage of them to save, and I heard a gentleman whisper that he thought one in ten would be a very good percentage. I think so, too. I do not think I have saved more than one in ten.

I thought Dr. Thayer made a very good point. He said he did not kill nerves; he did something better, he tried to save them. I thought that was very good, but afterwards he went on and said he did save them. Dr. Thayer has the advantage of most of us from the fact that he treats them differently from our method, and differently from the usual method; he treats them homoeopathically. It may be that he has this grand success, and that we would have the same success if we treated them as he does. I think the paper is admirably written, and I am glad it was read here.

Dr. Giese.—I would state that the tooth I spoke of was opened within a year, and the pulp was found to be in exactly the same condition as when it was capped, and just as sensitive to cold. It has been recapped. I have seen it several times since and it is quite comfortable.

Dr. Otobengu.—I would like to emphasize the remarks of Dr. Luckey in regard to the use of the terms nerve and pulp. The misuse of terms in that way gives us a great deal of trouble. Dentists do not have to deal with dental nerves except as they are connected with the tissues of the tooth where there is trouble and consequent pain; and probably that would not occur were not the pulp tissue environed by the hard and organizing substance of the tooth. I understand the pulp to be composed of connective tissue, and amenable to all the laws that govern other connective tissue, and that suppuration in it would be easily controlled except for the fact of its position.

The essayist said that when he capped these pulps he tried to have a little concave surface over it, so that there would be room

for any swelling that might ensue; and afterwards he told us that he never capped a pulp until he had it cured thoroughly by treatment. Now if a tooth is thoroughly restored to health when capped, what advantage is there in leaving that space? And if it is not cured, what is the advantage of the space? If it is not cured it would have, from the irritating edges of the cavity, an additional cause of hypertrophy, and the space in the cap would be a place for hypertrophy to get into, and that would not likely to become normal tissue again.

We hear a great deal about these pulps being saved, but we hear very little about their being opened and found to be alive after a length of time; whereas we do open many pulps that have been capped by men of excellent reputation and find them dead and putrescent. I have opened some that were capped by dentists in foreign cities, men of great reputation, and my experience has been the same as Dr. Watkins' that we generally find the very worst condition of things in there; if not pus, at least an odor is noticed as soon as you open it. It is true that some teeth in which the pulps are dead never give any trouble. The pulps have been destroyed in some way, perhaps by a blow or by regulating appliances, and still the dead pulps have remained without giving trouble; but when you drill in and let that "beautiful air" in which is so nice in these cases, I think you will hear from it in a few days. I fancy that the majority of successes that we have in nerve capping are simply gained by covering up the pulp from the air and hermetically sealing it, especially in cases where there is a minute foramen. In cases where the foramen is large I do not think one in a hundred is saved alive. Therefore I think a little arsenic is handy to have around.

Dr. Truax—Mr. President, with all due respect to Dr. Luckey, I think it is discourteous to say to a gentleman who has been invited here to make an address or read an essay, that we do not believe the statements he makes. I have no reason to doubt Dr. Thayer's assertion, and we have no reason to doubt his reputation for truth and veracity, and while I may not believe just exactly what he does, yet I do not treat the teeth as he does, and when he comes here and makes a positive statement of results based upon entirely different methods of treatment, I think the least we can do is to accord him the courtesy of assuming that he tells the truth.

I do not think there would be any objection to that, and with all due respect to Dr. Lusk, I think that much ought to be ascertained.

Dr. Lusk.—Perhaps I have been misunderstood. What I said was not intended as cast a reflection upon Dr. Thayer, but that I did not think it was possible to ascertain the results which he stated. Dr. Thayer, I think, will admit that he has not examined nine out of ten of the teeth he has capped for the purpose of ascertaining the condition of the pulps; therefore I think my statement will hold, that he is mistaken in his estimate of the success attendant. And I think my belief in the matter will have to stand whether it is considered disrespectful to Dr. Thayer or not.

Dr. Thayer.—Certainly, I should be very much gratified indeed to open up the sacred graves of all my departed friends to ascertain if they are in fact dead. Such a demand is unreasonable, when one's patients are under constant observation, and by frequent examinations it is found that no soreness, swelling, pain or pulpitis has supervened, we may know that the pulps are alive, healthy, normal, enjoying perfect physiological action. We want no resurrection or unnecessary post-mortem discussion.

Dr. Stockton.—I have no doubt that if you did open some of the graves you would find them dead.

Dr. Greene.—I believe that one-half of the failures in trying to save exposed pulps come from not giving them time enough before capping.

Dr. Thayer.—I think the whole matter hinges, not upon making the operation, so much as upon the constitutional treatment before it is made. I have given in that paper the results of not less than twenty years of observation and practice.

Dr. Wm. H. Trevelick.—The phrase "an exposed pulp" has always seemed to me to be a somewhat meaningless expression. Exposed pulps may be in so many different conditions that our practice and experience in treating them will necessarily vary according as we appreciate the condition. A pulp that has been recently exposed, and that has no pathological disposition, may be, I think, treated and capped with success. I have had many such cases in which I think I have been successful. But a pulp that has been exposed by the gradual approach of caries, and that is in a diseased condition, I do not think can be capped successfully by any method. There have been started certain changes in the tissue

that will certainly go on, and which will, sooner or later, cause the death of the pulp. Perhaps they may be kept quiet twelve months, possibly three or four years, but death is inevitable. A careful microscopical examination of a tooth that is seriously affected by caries will show a number of changes which are constantly going on; the effort which nature makes to resist decay sometimes changes the vitality of the organ. My own experience in cases that seemed favorable in every way is that sometimes I have succeeded; but in cases where I am not sure the conditions are favorable, I do not now attempt to cap. I think it is better, when a pulp is partly dead, to apply arsenic and destroy it at once and completely. I think it is much better to do this than to put a cap over the pulp and have it die afterwards. Pulpes that die under the cap leave the tooth in a worse condition than it would have been if it had been treated with arsenic in the first place.

I never like to doubt any one else's experiences. It is true that some dentists succeed by precisely the same method that others find failure in. The paper that has been read, and which I have listened to with extreme interest, has been carefully and thoughtfully written, and I do not feel that I can say much about it until I have had an opportunity to read it over. To me it is a new subject, and there are new suggestions there which have impressed me favorably, and I shall look for the publication of the paper with the extreme interest that I have listened to its reading this morning.

The paper was passed.

The next subject presented was the application of Logan Crowns by

Dr. B. A. R. Ottolingue—Mr. President and gentlemen: I have not prepared any paper further than what you see on the wall. (Referring to drawing illustrating the subject of tooth crowns.) I think that the subject of tooth crowns is so practical a one that I can tell you all I know about it as easily as though I were to write it beforehand.

When the Logan crown was first made, I commenced to use it, and as far as I can understand, it was simply meant to be an ordinary pivot tooth with the pivot made of metal and baked into the tooth; having the advantage of the pin being fastened in the crown, and the cement with which it was set in the root taking

place of the swelling of the old wooden pin from moisture. When I first got hold of the Logan cements, I put them in with the idea that the oxyphosphate cement was going to hold them in place. I think the first one I set came out in about two weeks. The next one I think did a little better; but I believe that all the cements which I set with oxyphosphate cement came out in course of time. Then I tried amalgam; and the last one set with amalgam came out last week. I then began putting them in with gutta-percha; and most of those I set with gutta-percha have kept their places. Still I was not satisfied that I was doing more than haphazard work, and I wanted to do something better. But before passing to what I consider was an improvement upon the old method, I want to show you how the old method was wrong. I refer to those put in with oxyphosphate. The pin was pointed; and the canal, as represented in this chart, is generally a perfectly cylindrical hole. What is the result? The only point at which this pin touches the walls of the canal, if it touches them at all, is the point where it first enters the root. Consequently, the deeper you cut down the canal, the wider becomes the layer of cement around the pin. What happens? The tooth in the opposite jaw bites against the crown at this point, and there is a tendency to tip it backward. There is a constant strain against the cement, and moisture is permitted to enter; the cement is disintegrated, and off comes the crown.

As to the crowns put in with amalgam, I will say this: Logan originally began with a small round pin, and found that the amalgam eat up the pin. The pin that is used to-day in the Logan crown the amalgam does not eat up; but the tooth is not held as tightly as it can be with either oxyphosphate cement or gutta-percha. In the case I spoke of, where the tooth came out last week, I do not suppose that its loss can be set down to the fault of anybody. The boy originally broke his tooth in a game of football; then the crown which I put on was knocked off with a baseball. He wore this last crown two years and a half, and then it was knocked off with a baseball bat. The point which I wished to get at was to make a tool which would cut that canal the proper shape to receive the pin. This instrument does it. I sent the pattern to the manufacturer, and I take pleasure in saying that I was attended very considerably and handsomely. They took great pains to make the instruments as I wanted them, and after several

changes were made they turned out the instruments as they are to-day, and which cut the canal very nicely indeed. The reamers are made in three sizes, and they make the hole to fit the pins.

The next point is in regard to the old method of setting those crowns. The crown comes shaped as we see it here (referring to drawing). The object was to be able to fit that to the natural root without tearing the gum. You had to use very small stones or chisels, and in nine cases out of ten you lacerate the gum to a considerable extent; and I think that is one of the causes of recession of the gums. I went to the dental depots to find a facer. Every facer I found was convex on the surface, so that it would cut a concave hole in the root, or they were simply burs; the result being that at the first turn of the instrument it would clog and would not cut any more. These instruments, which I have devised, are narrowed back from the point towards the shank, so that the cutting point is the widest point. Then these flanges allow the *debris* to run down between, so that the instrument will cut ahead *ad libitum*. When that instrument is put into the root of a tooth it cannot cut anything that is not already a canal. The further you go down the greater the difficulty of cutting, and the less the danger of going through the end or the side wall. From its rigidity it is impossible for it to turn a curve, as with some instruments. The instrument being curved, will take up the *debris*, which it cuts; and when you remove it from the tooth the *debris* in the groove will show exactly the depth to which you have cut; and that can be laid on the pin, and will show exactly how much room you have for the pin. Dip the instrument in a glass of water and it can be perfectly cleaned. The other instrument should also be cleansed after use, otherwise the blood and other material upon them will interfere with the cutting edge.

The way I set a crown is first to ream the canal so as to exactly fit the pin. But I want to warn you against being in a hurry, for one object I have is to depend not merely on the cement, or whatever material is used for setting the crown, but somewhat on the mechanical arrangement of the pin in the root. A cross section shows that the pin is flattened in the center, and has a flange on its two edges. If the reamer be allowed to cut down into the canal, and is simply moved backward and forward, it will drill an ellipse, an ellipse that will be perfectly rhomboidal; therefore, when the pin

is put into the tooth it touches the walls of the canal at four points. There being a square surface and a grooved one, there is a space on both sides for cement. The depression in the tooth leaves room for the cement; consequently in addition to the holding power of the cement, you have that of the impingement of the pin upon the walls of the canal at four points.

I recently had a case where the crown of a central incisor was so badly decayed that I advised its removal and the setting of one of these crowns. The lateral also had a large cavity in it, and the patient wished to have the lateral cut off too; but I deemed it advisable to save it. I cut off the ventral and fitted my crown and pin, and was about to set it when I found the patient determined to have the other one cut off and crowned also. That I objected to, and referred the matter to her father. In the interim I filled the lateral with oxyphosphate and put a Logan crown on the central, not using any cement, for the reason that I wished to take it off subsequently, for the easier filling of the lateral. About that time I went to Albany, and the patient was out of the city for three months before I saw her again; then she came in determined to have the lateral cut off and crowned. I refused to do it and the result was that the case was left to me. She was going away again and wanted to know if the oxyphosphate filling would not be left until she came back. I was about to let her go away when it occurred to me that I had not fastened the Logan crown on. I tried to remove it, and found it impossible to do so with my fingers. To be sure about the matter I looked up the record, and found that the crown had not been set. But it was necessary to use the forceps to remove it. I did remove it and set it personally. That circumstance is related simply to show the value of the mechanical adaptation of the pin to the root, irrespective of the cement. In order to get that perfect adaptation you must cut very slowly with the reamer, because while the reamer may be the exact size of the pin, it is only the exact size of the pin for a certain length, and not as far as the pin goes. If you send the reamer a little bit farther, your canal will be too large for the pin. Therefore, I say cut a little and try your pin, then cut a little more and fit your pin again, and so on until you get it in, as you see it in the drawing here. The tooth must not, at first, go quite into place without the use of the mallet, and must be fitted so tightly that forceps will be required

to remove it. That, I think, is the ideal way of fastening a crown in position.

A word of caution about the facers. They cut very rapidly provided the canal has been reamed large enough at the mouth to allow the tip to go down and rest on the tooth structure; and there is a great temptation to cut right down to the gum, which I have done to my cost. Be careful too, instead of cutting your tooth square, cut it at a slant, leaving as much of the tooth substance on the lingual or palatal aspect as there is in the mouth. I generally square it off, as you see, considerably above the gum line, then cut this side off and ream a little down into the cavity. I put in my pin, and if it does not touch at this point I ream a little deeper and try again. In nine cases in ten you will find that you will need to take very little off the palatal side.

If you have everything fitted properly, when you tap the tooth into position it will form a good joint. If the edges do not come out as smooth as they should they must be ground off with a smooth stone and disks in the mandril, used alternately. That edge must be squared up to fit against the square edges of the tooth. Perhaps it will not fit as well as you can get it with platinum burnished over the end of it, but well enough. And the crowns stay on.

I may say right here that I have not said much about grinding the crowns. I don't do that. If my tooth is too long for the bite I take it off the root. The pin comes quite near to the surface, and whatever you grind away for the bite weakens the tooth very materially. Every bit of material that you take away lessens the value of the crown if you take it away from around the pin.

In these cases where the roots are not straight, where the canal seems to be curved, if the teeth were to be set in accordance with the angle the point of the tooth would be out of line so that the articulation would interfere with the crown, and it then becomes necessary to bend the pin. It is very easily bent and then driven home in the same way as before. The bending of the pin almost invariably makes it necessary to have the joint above the gum line on the palatal side. Therefore first find out the direction of your root, and the direction of the pin can be changed to suit.

Now when you come to a case where the crown is not cut off, a case where the pulp has been dead for a long time and decay has

gone on, there will be too large a hole for the use of the reamer. Suppose that the walls are still solid and the tooth sufficiently strong. It then makes a case for gutta-percha. The decay is removed as far as possible with spoon excavators, and the cavity scraped out, leaving the inside as rough as possible. In this chart you see the flanges which I spoke of on the pin. By cutting these flanges with a knife and bending the spurs down, it gives the pin a barbed appearance. The gutta-percha is placed around the pin and the pin driven into place, and it stays there.

In regard to gutta-percha swelling so as to split the root, I have only to say that you must use judgment in selecting the tooth in which to place it; you must not put gutta-percha in a tooth that is weak enough to be split by its expansion, a result which I think is not much to be feared. Now in cases that are set with amalgam, the space is first filled with amalgam, leaving the rough lines to hold the amalgam in, and while it is plastic an instrument is pressed into it and turned around in it, and the patient dismissed until the next day. By this method of restoring, with amalgam, the lost substance of the tooth, and reaming out of the amalgam a space for the pin, the root is considerably strengthened.

Here is a tooth that looks very much like a Logan crown, and I take great pleasure in bringing it to your attention tonight. I believe it has not been shown before. It was described to me in Boston by Dr. Bliven, of Worcester. I happened to ask him what crown he used and he described this. A piece of platinum is furnished over the end of the root. A hole is drilled through the center of it and the pin is fitted into the canal. He uses the Logan crown pin. He then takes a plate tooth with cross pins and grinds it, fitting it nicely and setting it at the desired angle, and allowing the two pins in the tooth to wrap around the pins that are set in the canal. He then packs tooth body around the pins and bakes it in the furnace. In this way he practically makes a Logan crown for each case. The only advantage is that he gets a perfect joint with the platinum.

Dr. Van Woert's crown is practically the same thing, with the exception that the final element is gold solder.

Another reason why I call your attention to this crown is that it will not only make a very pretty single crown, but can be made the attachment for bridge work without danger of infringing anybody's

rights. After backing you can solder a bridge to it when that is desirable. My experience with the Logan crown tells me that this tooth, if properly and accurately set, will last as long as any other.

I don't wish to argue that any method is a failure because of the failure of single cases; but it is remarkable that so many teeth roots have been lost that have been banded. I presume that is largely due to the way in which the bands are put on—because they are many times improperly fitted; I have been obliged to abandon their use. I have seen Logan crowns fail, as in those that I put on before I made these reamers. It may be in some cases a band is a good thing, but I think that if there is any tendency to gingivitis, or similar diseases, a band is a very bad thing to put under the gum. And it seems to be not absolutely necessary, because the porcelain makes a prettier piece of work, and the joint is much better, and I have never seen a case where the gum has inflamed around a Logan crown.

bers of the society to defray the expense of publication. Dr. Levy offered an amendment that the treasurer make the assessment. Amendment accepted, and resolution adopted as amended.

The President—The discussion of Dr. Ottolengui's paper on the Logan crown, read last evening, is now in order.

Dr. Thayer—I would like to ask if Dr. Ottolengui has had any experience in the use of the Brown crown, and what his opinion is as to the comparative strength of that and the Logan crown.

Dr. Ottolengui—I did not say anything last night about the Brown crown, because I like Dr. Brown and I don't like his crown. There seems to me to be no advantage whatever in the straight or single pin tooth over the others, but in the double pin tooth I think there is a decided disadvantage. The double pin being set at two different points in the tooth, with a small portion of the substance of the tooth between the pins, that little portion of tooth substance between the pins is a point of weakness. It is the same with the Logan crown that has two pins. The pin is almost as tight as if it were vulcanized there, and when you tap the crowns into place they split. I have never broken a Logan crown until yesterday here. That was a double pin tooth, and it broke while being driven into position. I do not use the Brown crown for this reason. In the single pin I like a groove on the side of the Logan pin which gives a space for cement.

Dr. Thayer—Unlike Dr. Ottolengui, I think a great deal of Dr. Brown's crown, and, like the Doctor, I think a great deal of Dr. Brown. There is no question in my mind that there is a vast increase of strength in the Brown anterior tooth crown. Dr. Brown constructs his crown in such a manner as to build up on the pin a small portion of the body which he takes in the crown, and I think that adds a great deal of strength to the crown. The Logan crown is gouged out at this point (referring to diagram), and this is the point where the greatest strain comes upon an artificial crown, in my opinion, further down in the tooth; and that is why I consider the Brown crown vastly superior in strength to any other crown in the market, more than a hundred per cent. stronger.

Dr. Littig—I would like to ask Dr. Ottolengui how long he has been setting these crowns.

Dr. Ottolengui—I have been setting them ever since they were made. I think the new pin has been out about two and a half years.

Dr. Littig—Have been setting them in that way all that time?

Dr. Ottolengui—No. I think it is 18 or 19 months since I made the reamers. For that length of time I have been setting them in that way.

Dr. Littig—There have been many pin crowns put on the market and a large proportion of them seem to have been failures. I don't think we have sufficient data to talk intelligently about them as yet. As to the Brown crown I cannot conceive how we could have a stronger crown simply by the addition of parallelism, because the strength is usually given to a tooth by pressure in the mold in the first place, and when we add to it we do not have the same degree of strength.

Dr. Thayer—The White Dental Manufacturing Company manufacture these teeth in a mold, and they have the pressure there. There is no question that if you get more body of parallelism there you have more strength, and do not weaken the work. If a little is strong a good deal is stronger; there is no question about that. They are both made in a mold.

The subject was passed.

[TO BE CONTINUED]

THE CONNECTICUT VALLEY AND MASSACHUSETTS DENTAL SOCIETY.—UNION MEETING, JULY, 1888.

REPORTED FOR THE "INDEPENDENT PRACTITIONER," BY I. G. BAUMGARDNER, D.D.S.—(CONCLUDED).

Paper read by Dr. B. A. R. Ottolingui, of New York city, on "The Esoteric Law of Cure."

Dr. Ottolingui, by way of an introductory to his paper, said :

"The only apology I have for presenting this paper is that dentists are sometimes willing to hear of things outside the pale of dentistry. The question was raised whether dentists were allopathists or homœopathists, and in this paper I desire to maintain that we belong to no medical school or system, and therefore have the right to use anything that is best." *

The only remark on the paper by way of discussion was by

Dr. Geo. F. Eames, Boston, Mass., who said : "There is no such thing as allopathy. It is the old school of medicine, and the platform is as broad as any can be ; also the system of giving medicines, including physiological actions of medicines and the fixation of disease by experimental therapeutics to a certain degree. I object to the term 'allopathy' as designating the old school of medicine. All regular physicians object to it."

A committee appointed to investigate Dr. McLean's method of sharpening instruments report that Dr. McLean claimed that he could give a greater cutting power by his process of sharpening than by any other known ; and after an examination of the instruments and tools shown them by Dr. McLean, they endorsed the claim.

Dr. McLean was then formally invited to present his method to the society.

Dr. McLean—The method which I shall show you to-day may seem very simple to most of you. It, however, did not come to me at once ; but is the result of a long series of experiments, and is one which I have now practiced for a number of years. My method is simply to use emery paper of different degrees of fine

Dr. Ottolingui accomplished his task fully to the satisfaction of the audience ; but as the paper was not of a character suited to our columns, we have not included it in the report.—ED.

ness, running from 9-60-1000-0000, according to the fineness of the edge I wish to produce. For small instruments, I cut out disks from emery paper, same size as the sand-paper disks in general use for polishing filings. I first place on the mandrel in the engine a disk cut from some thin metal of some size as the emery paper disk; and on this metal disk a similar sized disk cut from thin pasteboard, and on this is placed the emery paper disk. The secret of the process is always to hold the instrument at the same angle against the disk, and to run the disk away from the cutting edge; and, as soon as the feather edge appears, to keep using a finer grade of emery paper until it disappears. Then you will have a perfect edge. The reason why this gives a better edge than a stone is that the stone wears away under the instrument by long use, thus forming grooves or irregularities; so that it is impossible always to have an even surface under the instrument. The emery paper being flexible, and the pasteboard under it acting as a cushion, always keeps an even surface under the instrument.

Another important advantage to be obtained by this method is that the edge of the instrument is always in view, and by watching carefully the formation of a "feather edge" may be avoided. This cannot be done on a stone where water, oil or lather is used. The consequence is that we go past the point where the right degree of sharpness is obtained and the "feather edge" is produced.

I have tried emery paper made by different manufacturers, but have not found any that cuts as well as that made by "Hubert," which is a French paper.

For sharpening large tools I have a machine made like a lapidary's wheel, that runs a large disk which runs horizontally. By having the disk so run you can keep a better watch of the edge of the instrument, as it is always in plain view.

For sharpening burs I use hard rubber corundum disks, grinding the edge of the disk thin by running it against the emery paper. The corundum disk is placed in the engine and the bur held in the hand. I find a jeweler's magnifying glass quite materially in judging when the edges are perfect. Run the disk through the grooves in the bur. A very important point is not to let the burs and instruments get very dull before sharpening. By sharpening every day there will be no trouble about keeping your instruments in good order and will take but little time. You can easily see

over all your instruments in quarter of an hour. [Dr. McLean then gave a practical demonstration of his method, sharpening both burs, excavators, ordinary vulcanite scrapers and pocket knives, until they were sharp enough to split hairs or shave with.]

Dr. Emerson.—I wish to endorse the claims made by Dr. McLean. I have used instruments sharpened by him for sometime. I did not know his process before, but I *knew* that the instruments sharpened by him cut better than any others I had ever used.

Dr. Maxfield.—A paper which I read at Montreal last summer gave a very simple process for making these hard rubber corundum disks alluded to by Dr. McLean. This paper was published in the *INDEPENDENT PRACTITIONER* for October, 1887, and has since appeared in three or four other journals published in this country and in the *British Journal of Dental Science*, published in London, copied from the former journal. The expense of making these disks is very slight.

Dr. S. G. Stevens.—I would like to present for your examination a new head-rest which I have recently had made. It is made of wire, woven together similar to the woven-wire mattresses. I find it the most comfortable of anything ever used for a head-rest. Arrangements are being made to place it on the market. I will pass it around for your inspection.

Dr. Andres.—I would like to call attention to a process for tempering instruments. Every dentist should know how to temper his own instruments; and of the many methods of doing this I think this one the best. Take the crystals of cyanide of potassium, melt them in an iron crucible. Heat the instruments in this liquid and then dip them into a solution of silver, such as is used for silver plating. By doing this you will get an instrument that will stand better than if tempered by any other method.

Dr. Waters.—I would like to utter a word of caution in regard to using this process. The cyanide of potassium is a violent poison, and great care must be used to prevent inhaling the fumes. I do not think it is a safe process to use.

Dr. Stanton.—The same result can be accomplished by using the ordinary potash. Heat the instruments to a red heat and plunge into crystals of potash. Heat to a bright cherry for common cutting instruments, and there is no need drawing of the temper afterwards.

Dr. Searle—There is nothing new about the process. It was brought before the Connecticut Valley Dental Society and discussed by them over twenty years ago.

Dr. Waters—When I was a boy in my town, the making of penknife blades for my friends was a great pleasure, and the blades I used to make were considered better than those they could buy. My method of tempering was this, the blade was first prepared and brought to an edge. I then would warm it and stick it into a piece of soap, then I would heat it to a cherry red and plunge it into water. The surface would come out perfectly clean. I would then draw the temper to the degree desired.

Dr. J. E. Stanton presented a simple arrangement for making a gas furnace for continuous gum work. The entire expense of which did not exceed three dollars. A full description will be published later.

The committee appointed to investigate the merits of Dr. Harwood's nitrous oxide blow pipe, which he also gave to the profession without any restrictions, reported that for utility, simplicity of construction, and economy in use, they felt no hesitancy in fully endorsing it.

Dr. R. R. Andrews—Mr. President, in order that we may show some appreciation for what has been given to the profession at this meeting, I would like to introduce the following resolution:

Resolved, That a resolution of thanks engrossed on parchment and signed by the officers of the two societies be presented to Dr. J. E. Stanton, Dr. E. P. McLean and Dr. G. G. Harwood, for their liberal donation of these inventions to the profession.

Unanimously adopted.

The society then listened to Dr. Merriam's closing address, which was as follows:

"The time has now come for the meeting to adjourn, as it was Dr. Andrew's share to bid you welcome, it is now mine to speak the good, old word good-bye.

"The French nobleman's answer when told that 'much would depend on Providence' comes to my mind now. 'Providence,' said he, 'should think well before it sets itself against a gentleman of my position.' Providence has certainly thought all the time of this meeting, for the only interruption of the fine weather that we have had has been in the night time, when poor tired men could rest.

"The reception and kindly feeling that Boston has for all I need not call to mind. But it is with great pleasure that she receives here the society of remarkable geographical boundaries, The Connecticut Valley Dental Society. We feel that it must change its name and be known or described as The Alaska and St. Augustine Dental Society.

"We shall watch its future growth with great interest, and shall not be surprised to hear that at some future meeting that they are to excavate and fill the Mammoth Cave and have yoked Niagara to their dental engine, and have the National Bridge of Virginia among the specimens presented.

"But their presence with us touches a deeper chord. For they bring with them guests from over the Canada border, their friends and ours; being united with them in membership, with us now in friendship.

"Gentlemen who come to us not, as many Americans go over the border, and who are best described as Cowper did the convicts in Australia.

"True patriots, for be it understood,
They left their country for their country's good.'

These friends come for our good and very great pleasure.

"We can but give them this parting word: May the Society and their guests continue to work together; may the Society increase until it is given the heathen for an inheritance, and the uttermost parts of the earth for a possession.

"So may the girdle of the sun,
Bind the east and west in one.'
"Till Mount Shasta's breezes fan
The snowy peaks of Ta Siene-Shan,—
Till Erie blends its waters blue
With the waves of Tung-Ting Hu,—
Till deep Missouri lends its flow
To swell the rushing Hoang Ho!'

"Our meeting has not been one of pleasure merely. I trust I speak for you when I say that there have been some features that will produce a lasting impression on us all.

"You have expressed by your vote the thanks of the meeting for the generous gift to us of the free use of this building, and have voted your thanks to the committees who have served us all so

well. But I cannot pass over the fact that this has been in one way a most remarkable meeting.

"Three gentlemen, Dr. J. E. Shenton, Dr. E. F. McLean, and Dr. Geo. F. Harwood, have from pride in their own merit, and from the love of the profession that was in their hearts, come forward and presented to the profession freely the results of their investigations—results which sold to patent companies, or held as trade-secrets, might have helped to hold the profession in ignorance or unprofessional relations with dealers.

"I cannot believe that this will soon be forgotten; for I am sure that each will be proud of the reception you gave them. All of us are proud to have given it, and look with great pride on them, and on our profession that produced them.

"This cannot, must not be forgotten.

"The Athenian races were not less sharply contested that the prize was only the laurel wreath, and when the profession, either in a meeting like this, or better in a national academy formed for the purpose, places on the brow of those who serve her with honor, by giving to humanity and the world that which increases our knowledge and power, the recognition of faithful service. We say to dental college deans and professors, that there are nobler occupations than 'depot steering,' other avenues to fame than the advertising pages of trade journals, and higher rewards than the dishonoring dollar of the patent dealer.

"I said just now that you had thanked all committees, pardon me if I bring before you again the labor done by one; that of the Committee on Exhibits. I know the work done by each; but it has been my own to aid that one, so that I know of the faithful service of Dr. S. G. Stephens and Dr. W. E. Page, and feel that I may congratulate them again for you.

"It was my pleasure to tell you to Dr. Page what I gathered, and he has systematized and arranged it. I feel, too, that the exhibition spirit should be recognized. For, when a year or more ago, members of the profession visiting New York learned that exhibition privileges had been refused to some, without organization or plan, they each determined on their return, in right measure, that is as far as Boston was concerned; and as they met, each aided the other to open the doors to all who wished to serve the profession, and may they never be closed so long as we have exhibitions.

"This standing rule regarding them has been adopted by both societies to prevent their being degraded to unprofessional or exclusive purposes.

"No committee or officer of the society shall grant to any exhibitor exclusive privileges of exhibition or dispose of exhibit space to one firm, dealer or union of dealers in such way as to exclude or prevent free competition, or in any way hinder *any* having for sale articles of use to the profession from receiving *equal opportunities of exhibition.*"

"You will notice that this secures to the largest exhibitor equal rights without denying to the maker of one article equality with him. And makes a society unprofessional who would dispose of all space to one individual or firm, because it gives to them power to exclude all others if they wish, and a society cannot escape blame for unprofessional results that it allows to pass unrebuked. It provides that the exhibitions shall be for the profession; for those who do not come to sell their article, but who wish to lease only, cannot claim to be dealers, or that they desire to serve any but themselves.

"The profession is to be congratulated, also that a movement has been begun against 'the combination.' The control of our requirements, those things which our needs create, cannot be allowed to pass from us. We control and need have no fear of the future, if we provide that all who wish to serve us are recognized, and are given opportunity. Our professional honor is stained if we do not protect our individual workman or lend ourselves or our societies to build a prohibitory wall against one poor man or man of small means.

"I have always wanted to get my friend President Andrews into just this position, where we can acknowledge that the microscopist is at the top of the professional ladder, and call his attention to the fact that we are looking well to the foundation on which it rests; for it is manifest that unless the profession controls the requirements of its practice, the microscopist worketh but in vain.

"This then is a sketch of what we have done. As we part to-day to go back to life's ceaseless toil and endeavor, let us carry with us to refresh and cheer us memories of the days passed together in Boston.

"And though fate may throw between us,
The mountains or the sea,
No time shall ever wean us
Nor distance set us free.'"

Editorial.

VALUABILITY.

With this number closes Volume IX of the *INDEPENDENT PRACTITIONER*, and with it end our first six months' work in dental journalism. Hardly more than an introduction. If we have succeeded in satisfying our readers thus far we shall be much pleased, for our summer's work has been a very trying one. Our editorials have been written on trains and in hotels without books of reference. We have been haunted with proof in our journeys in many cities and states, which has been corrected under very great disadvantages.

We are fully aware that some typographical errors have been overlooked, a few grammatical slips have crept in, and in some instances some loose writing has been allowed to pass uncorrected. Our only apology was our lack of time to carefully consider every detail. The last six numbers of the journal have been the result of our unaided efforts, and whatever of error or shortcomings is therein contained is ours and we must accept your criticism. We have not, unfortunately, a trained corps of assistants upon whom we can depend to carry on matters while we are away, as have some of the other journals, but must depend upon ourselves. Had we known that so much of the work would have fallen upon our shoulders unaided, we should never have made arrangements to "swing the circuit" of the dental meetings for the summer, let alone to take part in their programmes. In addition to the other drawbacks, the change of publishers has been added. We are now, however, fully established in our new quarters, and proceed with bated breath for Volume X than has been done on Volume IX. The business of the Journal is in a most prosperous condition. Many new subscribers have been added the past summer, and the outlook for the future is very bright. What was termed "editorial toasting" in our first announcement has become a tradition, and the first of the year will see the *INTERNATIONAL DENTAL JOURNAL* successfully launched upon the sea of journalism.

On account of the change of name we have thought best to invite Dr. Barrett, former editor, and who has now accepted the position of associate editor to add a few words of retrospect in regard to the *INDEPENDENT PRACTITIONER*, and will therefore refrain from

further notice until the beginning of the new volume, when the purposes of the journal will be more fully set forth.

RETROSPECTIVE AND PROSPECTIVE.

With this number the INDEPENDENT PRACTITIONER ceases to exist. Not that the good old journal is to die—quite the reverse. But with the January number it will assume a new name, and be known no longer by the old title. When the chrysalis bursts its cocoon and emerges the winged butterfly, it is perhaps but proper that it should henceforth bear a title which will not recall its former life. And yet as one who loved the old journal and its old name, who labored for years to help in spinning that cocoon, who gave to the work all his hours of recreation and many of those properly belonging to needed rest, who found his pleasure and reward in the work itself, and the consciousness that he was assisting to build up the profession to which his life was devoted, the former editor cannot witness the change without some feelings of regret. From a very small beginning he had seen the journal grow with its added years, and increase in strength and influence as it gained experience and knowledge, until in the estimation of the most intelligent dentists it stood second to none in rank or influence. The writer will have this consolation—that the INDEPENDENT PRACTITIONER will be permanently associated with his name, and it is a connection of which he will ever be proud. However great the INTERNATIONAL DENTAL JOURNAL shall become, and much as its fame may overshadow that of its progenitor, it will not entirely obliterate the recollections of the past, and herein is some comfort to be found, even though it be from a selfish view.

When the former editor looks back upon the history of this journal he is filled with astonishment. That men without journalistic experience should be able to steer clear of the thousand rocks in mid-channel which have proved disastrous to much better navigators is a piece of good luck which they had no right to anticipate. The only explanation of the measure of success which the journal attained under their management is found in the fact that the time was ripe for such an enterprise, and dentists ready to sustain such a work, even though it was pushed forward with more of zeal than ability. It was a transition period in our edu-

educational affairs. If one will look around and see what a great change in this direction has been wrought during the last few years—changes which the Journal has labored with others to bring about—he will better comprehend that the period of its foundation as a dental journal was one, which demanded the expressions in which the INDEPENDENT PRACTITIONER always endeavored to give voice. It was "independent" not only in name, but in fact; and though often mistaken, perhaps, it was generally believed that its errors were those of judgment and not of intention. The men who were connected with it were not believed to be seeking any ulterior objects of their own, but to be working for that which they believed to be the best good of dentistry. In this faith the Journal was enabled to gather a corps of contributors and supporters such as any journal might be proud of. The best intelligence of dentistry was glad to write for its pages, and the readers comprised the very best men in the profession. It did not pretend to monopolize this intelligence by any means, for its worthy contemporaries could all, in greater or less degree, claim the same; but it was certain that none had any cause to boast over the INDEPENDENT PRACTITIONER.

The time came when the very success for which the members of New York Dental Journal Association labored so strenuously seemed to defeat them. The labor became so great, the business interests so complicated and the responsibility so overwhelming, that they were unable to stagger under it longer, and it became necessary to find broader shoulders, and those which carried less of other burdens, to sustain this constantly increasing weight. In this emergency "The International Dental Journal Company" was formed, a man of commanding ability secured who could give to the business his undivided attention, and the old publishers, still retaining an interest in the Journal, turned it over to a more vigorous and capable management. Six months of their work is now before the subscribers, and each is capable of forming an intelligent opinion concerning what the future will probably bring forth. There can be but one opinion; and that is that a wide field of usefulness opens before the Journal, and that the hands which now manage the paper are entirely competent to meet the craft with even the fiercest storms. The subscribers must see that the present editor has much greater facilities for serving them than their last one.

and that he is capable of giving them a journal which is 'much more worthy their patronage than it has been in the past. It is therefore the duty of every one to stand by him, and give him their active aid. Whether or not dentistry is to have a literature worthy of it depend upon them. The editor has disengaged himself from all other business, that he may give his whole attention to journalism; and it will be but a poor encouragement for such labors if dentists do not give him a fitting support. Every dentist who has the good of his profession at heart will therefore endeavor to sustain him in this, the first instance of the entire devotion of a competent man to dental journalism.

That the Journal under his management has doubtless now entered upon a career of honor and usefulness to which its past was but an introduction, no one will dispute. The undersigned has accepted a position as associate editor, although he prefers that his name should not appear upon the cover page, as the managing editor desires; but he will be only too glad when he can see an opportunity to serve the INTERNATIONAL DENTAL JOURNAL and its readers by contributing to its pages.

W. C. BARRETT.

No. 208 Franklin St., Buffalo, Nov. 20th, 1888.

THE AMERICAN AND SOUTHERN DENTAL SOCIETY CLINICS AND EXHIBITS.

Several things combined to operate against the clinics. In the first place no special time had been set apart beforehand for clinics, and the practical work was thus thrown in the background. Then the weather was so bad that no one had energy enough to take hold and manage them. The separate business meetings of the two associations, and the two joint meetings daily, followed so closely upon one another, that each day was fully occupied, and no opportunity was found for clinics, except a clinic in continuous gum work, by Dr. L. P. Haskell, and one in aluminum casting, by Dr. C. C. Carroll.

The exhibits, on the other hand, were fully up to the standard of former years. A new feature was introduced into the exhibit in the shape of many new electrical appliances. Dr. Starr, of the S. S. White Dental Manufacturing Co., had several novel and useful appliances. The motor power was taken directly from the electric wires and a governor or regulator introduced to control the current

and prevent shock. It seems as if this one dangerous element was now eliminated from the field, and that hereafter always, harnessing as a motor power will be relegated to a back seat.

Dr. J. Rollo Knapp, of New Orleans, had a very elaborate and complicated array of electric appliances for office and laboratory use, and which justly attracted a great deal of attention. We heard some one remark that he would be afraid to have a room filled with such a display of electrical appliances surrounding him. It did look more like the office of a conjurer than that of a practical dentist. No one, however, doubts Dr. Knapp's ability to use all the appliances in his possession, and our admiration only shows how much we are missing in not introducing more labor-saving devices into our daily practice. The days of "small things" are rapidly passing away, and "hand pressure" and "line pulls" are being laid aside or lured with their victims. We speak feelingly of this matter because of our own experience in that misdirected line of manipulation. Any man who will provide himself with either one of Dr. W. G. A. Bennett's pluggers, and master their use, will add ten effective years to his life.

Dr. C. Edmund Kells, Jr., of New Orleans, had a very compact arrangement of the most essential application of electricity to office use, one new and very convenient appliance being a tiny incandescent light attached to the ordinary mouth retractor for examinations. An automatic reel winds up his cords, when not in use, out of sight, in a neat little cabinet, which also holds all the instruments to which the electric current is applied. Among them is Dr. Whitefield's device for bleaching teeth, by the liberation of chlorine gas from common salt and water in the cavity of the tooth.

The largest exhibitors were the S. S. White Co.; Chandler Ash & Sons; the Keller Medicine Co's. (dental specialties); the Welch Dental Co.; the American Manufacturing Co.; Lister's Pharmaceutical Co. (Listerine); Oliver Sibley; R. B. Williams; H. B. Justi; the Florence Manufacturing Co. (Ideal tooth brushes); Dr. L. W. Ivory (new rubber dam clamp and capite holder); Durand & Co., with Ward's electro-metallic dental plate, of gold and silver, made by electro deposits directly upon the cast, forming a perfectly fitting plate of silver with pure gold surfaces.

The exhibit of the S. S. W. Dental Mfg Co. contained How's porcelain inlays, more especially adapted for labial cavities in the

incisors; a gold plate-rimmer, a well-known tinsmith's tool adapted to dental use, to do away with soldering the rim on gold plates; two new rubber-dam clamps. How's cervix clamp and Johnson's lever clamp both are designed to hold the gum back from a cavity under the gum border, the latter also holding the lips out of the way. Robinson's collar pliers, designed to facilitate the work of shaping and contouring bands in crown work; Dr. Kirk's sterilizing apparatus for implantation operations, by which the sterilizing baths are automatically and accurately held at the same constant temperature. Their Primrose folding screen is a very practical device; the curtain-screen is hung on cords fixed at one end to the wall, and at the other end to a spring-roller in an upright hollow shaft, mounted on a base with castors, closing the screen automatically by pressure on a brake-handle. Among their very large assortment of teeth are very thin yet strong teeth ground out on the lingual side ready for use in hurried rubber work, saving much time and labor in grinding; also some extremely artistic hand-made "old-people's teeth," reproducing the characteristic coloring and attrition of old age.

Gideon Sibley showed an entirely new form of gold called Sibley's Felt Gold, a thoroughly cohesive and homogeneous gold, spreading readily and conforming perfectly to the walls of the cavity, making a perfectly tight filling.

Claudius Ash & Sons had on exhibit many new forms of teeth; they also make a specialty of forceps, in great variety of form.

The American Manufacturing Co. had a very large display in new forms of instruments.

The Keller Medicine Co. had on display a great variety of amalgams, cements, dentrifices and many new preparations, including their dental resins, iodized, carbolized, morphiated, salicylated, capsicum plasters, etc., spunk, pledgets, styptic and other cottons. As is well known, all of their preparations are non-secret, having the formula printed on every package. They have also the "Gould" dental chair, the "new improved Gould," offering many superior features in movements and positions. It can be laid down horizontally for the administration of anesthetics, forming a flat table, or in case of chloroform narcosis, it can be tilted backward until the patient's head is two feet lower than the knees, making it unnecessary to remove the patient from the chair in case of emer-

gency. This is the only dental chair which can be adjusted to these positions. It can also be tilted downward and forward.

The advantages of the Pemberton Bracket will be readily appreciated. Instead of the usual drawers, this bracket has two trays, and four slides containing ten drop instruments, ranging in depth from short drops for engine burs to a depth sufficient for Varney pluggers, etc. When the slides are drawn out, the points of some 120 instruments are exposed to view, in a perpendicular position, each one in its own compartment.

Their "dry-grinding" corundum wheels and points, for the dental engine or laboratory lathe, will be found very durable, and much superior to the ordinary shellac sheets.

They have the exclusive sale of Wooley's Electro-Magnetic Dental Engine. This engine is very light, starts easily, having no dead centres, can be instantly reversed, or brought to a dead stop in less than two revolutions, while running at 2000 a minute, and is under perfect control of the operator by means of a foot pedal switch-board and brake. It has no rapidly revolving wheel, and makes no buzzing noise to frighten nervous patients.

Dr. W. H. Richards (Knoxville, Tenn.) had on exhibition a new abscess syringe, which, in addition to the large receptacle for tepid water, has a smaller one holding a few drops of the remedy to be used. The remedy is carried ahead of the water by pressure on the small bulb, and can be preceded or followed by water, without removal from the mouth, and without any building of air. It has points of different sizes and shapes for treating root canals, fistulous tracts, blind abscesses, antrum, etc.

Dr. Custer (Springfield, Ohio) had a new atomizer for ether-spray, etc., by which the flow of ether is controlled at will. The ether is thrown into a glass cylinder holding enough for three operations.

BUSINESS MEETINGS.

The two Associations held separate meetings for the transaction of the usual business, payment of dues, election of new members, necrological resolutions, elections, etc. But little special business was transacted by either Association. In both Associations resolutions were adopted and committees appointed to mem-

rialize Congress with reference to the removal of the tax or duty on dental goods of all kinds.

A resolution was adopted in the American Association declaring it non-professional for a dentist to place on his card anything more than name, title and address.

In the Southern Association, the *status* of the International Tooth-Crown Co.'s suits for infringements, licenses, royalties, etc., was discussed at length, and arrangements made for securing a fund for defence in test cases.

NECROLOGY.

The deaths of Dr. George W. Keely, Treasurer of the American Association, and Dr. J. H. Prewitt, First Vice-President of the Southern Association, were reported, and memorial resolutions adopted.

Also for Drs. Stoddard Driggs, I. H. De Vore, Wm. Dutch, and C. P. Fitch, members of the American Association; and Drs. J. S. Franklin, H. M. Grant, and J. H. Cook, of the Southern Association.

OBITUARY.

THE LATE DR. GEORGE W. KEELY

The death of Dr. Keely, occurring as it did just before the convention of the American Dental Association, cast a gloom over the opening exercises of that body. Dr. Keely had long been a member, and at one time its honored president. At the time of his death he was its treasurer, a position which he had held for a number of years. The sad accident that led to his death was a fall from the third-story window of his dwelling, while he was trying to mend a telephone wire connected with the office. In addition to internal injuries received by him in this fall of over thirty feet, by a singular accident an open penknife, which he held in his hand, penetrated the base of the skull, entering over half an inch into the brain. The knife was broken off in his endeavors to remove it, and it finally had to be chiselled out, so firmly was it imbedded in the skull. The accident occurred on Wednesday evening, August 22, he, however, retained consciousness up to a short time before his death, passing quietly away at 2 P. M. on the Friday following.

Dr. Keely was born at Oxford, Ohio, Oct. 22, 1822. In 1839 he entered the dental office of Dr. John Allen, of Cincinnati, with whom he spent two years. Returning to Oxford in 1841 he started a dental office at that place. After having been in active practice for about twelve years, in 1852 Dr. Keely graduated at the Ohio College of Dental Surgery. He was present at the first meeting of dentists held at Niagara Falls in 1853, where the foundation was laid for the organization of the American Dental Association. He was an active or honorary member of the Mississippi Valley, Mad River Valley, Indiana, Kentucky, Illinois, Missouri and Wisconsin State Dental Societies, and of the New York Odontological Society. He was one of the trustees of The Ohio College of Dental Surgery, and lecturer on Irregularities of the Teeth in the same institution. He was married in 1841 to Miss Susanna Walls, of Cincinnati, who died in 1856. Dr. Keely was again married in 1861 to Miss Cornelia Cone, of Oxford, O. Of the three children by his first wife, but one, Dr. Chas. L. Keely, of Hamilton, survives him, and of the eight by his second wife, but three remain to mourn his loss.

Of his personal character, Dr. Geo. West, who knew him intimately, thus feelingly speaks: "Our acquaintance with Dr. Keely began in 1853, and was intimate from that date forward. He was a true and trusted friend, and we think we have reason to know the manner of man he was, the strength of his friendship, the generosity of his nature, the integrity of his purposes and the deep sincerity of his life. He was a man of solid attainments; a man of rare character and genuine worth; a recognized master in his specialty of dentistry, and yet characterized by that modesty and self-forgetfulness and simplicity that so often accompanies true greatness. He was an enthusiast in his calling, and spared neither toil, time nor expense in keeping abreast with the progress of the profession. He never had a secret that would be helpful to others, that he did not labor industriously to communicate to his professional brethren. Of the extent and character of his writings, the readers of the *Ohio Journal* are enabled to judge from what have appeared in its columns during the eight years of its existence."

The following resolutions were offered and adopted by the American Dental Association, at Louisville, Aug. 20th, 1888.

WHEREAS, It having pleased Almighty God in whose hand is the breath of every living thing, to remove suddenly from this world

of his toils and his honors, our friend and associate, Geo. W. Keely, D.D.S.; therefore be it

Resolved, As the sense of this Association, that in Dr. Keely's death this Association has lost one of its oldest and most valued members, a former president, and for many years its treasurer. Genial and urbane in disposition, kind and affectionate in his family, eminently successful in his calling, Dr. Keely was one whom we loved as a man and honored as a dentist. Ourselves marching to the eternal world, let us loiter for a moment on the busy highway of life to hang this garland on his tombstone.

Resolved, That these resolutions be engrossed upon the records of this Association and a copy be forwarded to his family.

H. A. SMITH, Cincinnati,	}	Committee.
E. T. DARBY, Philadelphia,		
G. J. FRIEDRICH, New Orleans,		

BIBLIOGRAPHY.

Foster's Illustrated Encyclopædic Medical Dictionary: D. Appleton & Co., 1, 3 and 5 Bond Street, New York. Sold by subscription only. Complete in four volumes. The first volume, consisting of 752 pages, covering the alphabet from *a* to *cacos*, is now ready and before us for review. The amount of labor necessary to have gotten out such a work is simply stupendous. It is an encyclopædic compendium of medical and allied sciences founded upon independent reading, and is not a compilation from other medical dictionaries. It represents the unremitted labors of Dr. Frank P. Foster and twelve collaborators through two years time. Not only is the etymological signification of words given, but a most satisfactory and complete idea of the object for which the words stand is presented to the mind of the reader. The derivation of words is followed out most carefully in all instances, and their foreign equivalents in nearly all cases are given, each word is pronounced, thus meeting a need which we have all felt in the medical dictionaries commonly in use.

The definitions are based upon independent readings of the productions of prominent medical and scientific authors and writers. It is amply and well illustrated with good wood cuts. It is printed on an excellent quality of paper, and the typographical and press work are most excellent, as that in general of D. Appleton & Co.

As examples of the accuracy and extent of the work we will quote one or two examples. "Amalgam, *N.*, *alloy of gold*. (The figures refer to letters in foot note.) In this case 1. *a*, or 1. *ab*; Lat., *amalgama*. From *lappa*, an emollient; (from *pellere*, to make soft.) Fr., *amalgama*. Ger., *Quecksilberlegirung*. It., *Sp. amalgama*. 1. A combination of mercury with some other metal. 2. A soft alloy. 3. In general any mixture of dissimilar things. (B. 2).—*Chasé's new a.* A dental *a.* Made by melting 40 parts of pure silver, and adding 30 pure tin, stirring, and adding 5 each of bars of zinc and antimony and 10 of beeswax, shaping and removing all traces of iron with a magnet. Mercury being finally added at the time it is used. (L. 125).—*Conbeur's a.* A dental *a.* Consisting of 58 parts of silver, 37 of tin, and 5 of gold, and a sufficient quantity of mercury. (L. 125).—*Dental a.* Fr., *amalgame des dentistes*. Ger., *ahn amalgam*. A composition used for filling cavities in teeth, made of mercury and one or more other metals. Gold, silver, copper, tin and zinc are most commonly used for this purpose etc., including the formulae for *electricaf, faring, freed tooth, Hahn-mayer, submarine* and Townsend's amalgams, with directions how to keep, etc.

Under the head of bacteria fourteen pages are given, including the physiological and morphological appearances together with a complete bibliography. An example is found in Miller's *epistole*.—"Miller's name for a slender, straight, or more or less curved, non-septile rod-form, found in carious teeth along with four other micro-organisms, designated respectfully as *a*, *b*, *c* and *d*. It often occurs in pairs, assuming then an *v* or *w*-shape. It liquefies gelatine. Applied, to teeth it produces caries. In its growth it resembles the spores of Finkler Prior, and is probably identical with it." Under the head of bone ten pages are devoted to the subject with ample illustrations. Too much cannot be said in praise of the work, but we will refrain at the present in order to have something to say of the succeeding volumes.

A Practical Treatise on Artificial Crowns and Bridge-work. By George Evans. With 500 Illustrations. 16mo, pp. 228 and index. Philadelphia: The S. S. White Dental Manufacturing Co., 1888. Price, cloth, \$2.00.

The work is well gotten up and well makes a very creditable appearance. The illustrations are good, many of them

original, while others have been taken from the *Cosmos*. The work to a certain extent is a compilation on the subject. The author has done his work well, and has evidenced a power of description in explaining mechanical methods that is possessed by few writers. As a reference handbook the volume deserves high rank and should be in the hands of every student as well as practitioner, for in it may be found all the practical methods that have been presented on the subject of crown and bridge-work up to date of issue.

ELECTIONS.

AMERICAN ASSOCIATION.

Saratoga was chosen as the next place of meeting. The following officers were chosen:

President—Chas. R. Butler, Cleveland, Ohio.

First Vice-President—A. W. Harlan, Chicago, Ill.

Second Vice-President—S. A. White, Savannah, Ga.

Corresponding Secretary—F. A. Levy, Orange, N. J.

Recording Secretary—Geo. H. Cushing, Chicago, Ill.

Treasurer—N. H. Fuller, St. Louis, Mo.

Executive Committee (New Members)—E. T. Darby, Philadelphia; Geo. W. McElhany, Columbus, Ga.; I. N. Crown, Chicago; Frank Abbott, New York.

SOUTHERN ASSOCIATION.

Galveston, Texas, was chosen as the next place of meeting.

OFFICERS.

President—J. Y. Crawford, Nashville, Tenn.

First Vice-President—John C. Storey, Dallas, Texas.

Second Vice-President—Wm. N. Morrison, St. Louis, Mo.

Third Vice-President—J. S. Thompson, Atlanta, Ga.

Corresponding Secretary—D. R. Stubblefield, Nashville, Tenn.

Recording Secretary—M. C. Marshall, Little Rock, Ark.

Treasurer—H. A. Lawrance, Athens, Ga.

Executive Committee (one year)—Dr. Dyer, Dr. W. R. Clifton, Waco, Texas; (two years), Dr. G. S. Staples, Sherman, Texas; Dr. B. H. Catching, Atlanta, Ga.; (three years), Dr. H. E. Beach, Clarksville, Tenn.; Dr. H. I. McKellops, St. Louis, Mo.

Current News.

DOMESTIC CORRESPONDENCE.

TO THE EDITOR:

The chief cause of failures, when moulding celluloid by either process, all on dry heat, is owing to the form of the blanks, which could be easily remedied by changing the moulds, which necessitates from a half to an hour's hard work of scraping and filing, with the result then of only a faint approximation of what a blank should be.

That the color of the celluloid blanks could be made to resemble every shade of mucous membrane, no one can doubt who is at all familiar with the innumerable articles of every conceivable shade now on the market.

The tendency of celluloid to warp and distort can be overcome by moulding it in a plaster investment heated to a temperature of 225° in a dry chamber.

The moulding at this high degree of heat must be done inside of 5 or 6 minutes, or the celluloid will either become porous or hard.

The judgment now necessary to mould a celluloid plate in five minutes, and have the denture come out perfectly finished, all ready to be placed in the patient's mouth, without any filing or polishing, requires mechanical skill of a high order trained by long experience.

It seems to me that the following method will enable any mechanical dentist to make a perfect celluloid denture every time without a failure.

Set the teeth up in paraffine in the usual manner, trim and shape the paraffine to the exact form you wish the celluloid plate to have, run a small bead of paraffine around over the pins, dip the case in cold water and remove the teeth with the thumb and finger, partially fill the cavity left by the teeth with melted paraffine, invest this paraffine pattern on a tin die in plaster, the same as you would if the teeth were in place.

Scrape and file a celluloid blank, especially in the back, until it fits exactly the form of the paraffine pattern as possible. Heat the plaster investment, and mould at about 225°. Get the plaster all off of the celluloid, even if you have to polish it. You will then have a perfect blank, which can be easily moulded from the teeth in five minutes, without any danger of cracking the teeth or cracking the investment. This process takes time and trouble, and there is a greater demand for these perfect celluloid plates at \$30 each, than for vulcan plates at \$10 each, by the same class of people.

In the six years that I have made celluloid plates by the dry heat process, I have never seen a broken one. The teeth break the same as on other heat.

To replace a broken tooth: Select a tooth over the pins with an excess of paraffine, place it paraffine up in the lower half of a flask filled with plaster; fill the upper half of the flask with plaster, open the flask and remove the paraffine; heat the investment and melt a piece of celluloid as to the tooth the same as if you were moulding a whole denture.

Enlarge the cavity, left by the broken tooth, on the lingual side. After grinding the tooth and shaping the celluloid until it fits perfectly, cement it in

place with collodion. The union of the celluloid will be perfect, and the tooth will be held as firmly in place as any tooth in the plate. The difficulties encountered in trying to overcome these two points have confined the manufacture of celluloid dentures to a very few dentists.

FREDERICK W. SEABURY.

Providence, R. I., Nov. 17, 1888.

TO THE EDITOR :

The third annual meeting of the Western Illinois Dental Society was held at Kewanee, Oct. 23d and 24th. F. Christianer, of Abingdon, the president, called the meeting to order, and, after preliminary business, read the annual address. The afternoon of the 23d and forenoon of the 24th was devoted to clinics. Bushnell was selected as the next place of meeting, and the following officers elected for the ensuing year: J. A. W. Davis, Galesburgh, President; E. M. Robbins, Carthage, Vice-President; A. H. McCandless, Rock Island, Secretary; W. W. Hart, Quincy, Treasurer; J. W. Murphy, Bushell; L. W. Skidmore, Moline; and R. W. Sharp, Kewanee, Executive Committee. The members of the society were given a banquet by the Kewanee dentists and physicians Tuesday evening. These meetings are especially interesting to the younger members of the society, as they are more free to take an active part in the discussion of papers, the giving of clinics, etc., than in the State Society. It is hoped the membership will be largely increased at next meeting. The number of members at present is forty-two.

A. H. McCANDLESS.

Rock Island, Ill., Nov. 15, 1888.

WE have personally investigated the merits of the office coat advertised by Hirsh, Frank & Co., in this issue for the first time. They are neat, well made, and as serviceable a coat as any one need want, and the price, \$1.25 each, is remarkably low. When in practice we used to have to pay \$4.00 each for office coats.

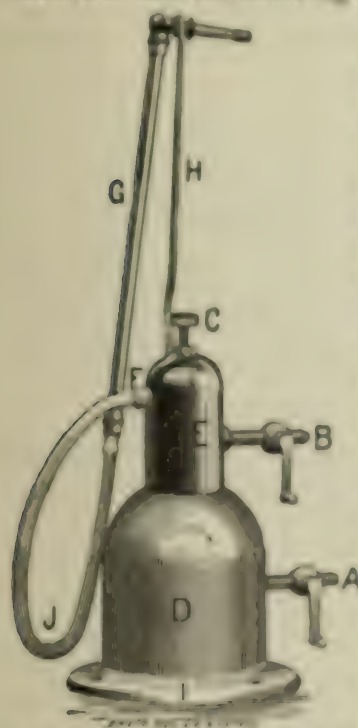
THE art of making stained-glass windows, which had its renaissance in this country within the last twelve years will be the subject of a popular and appreciative paper in the Christmas number of *Scribner's Magazine*, by Will H. Low, the artist, whose illustrations of Keats's poems have been so much praised. Some of the best work of John La Farge, Louis C. Tiffany, Francis Lathrop, Lyell Carr, and others will be reproduced among the illustrations.

We desire to call attention to the advertisement on page 22. We have used the brush there mentioned and find it the most convenient little brush on the market for cleansing the inner surfaces of the teeth and around third molars.

The articular has long been in use, and needs no word of praise from us. It is an instrument based upon scientific principles. If you really desire to articulate a set of teeth, scientifically, get one.

A NEW NITROUS-OXIDE BLOWPIPE.

At the Union meeting, Boston, July, 1883, Dr. G. F. Howard, of Wrentham, Mass., presented to the profession without let or hindrance as regards its manufacture or sale the following described Nitrous-Oxide Blow-Pipe.



The apparatus is designed to take Nitrous Oxide from the ordinary gasometer, at low pressure, or from the cylinder at high pressure, and economically combine the same with ordinary illuminating gas in any desired proportion for soldering gold or platinum, melting at high temperatures, or for any purpose where the perfect regulation and control of a powerful and unextinguished flame is required.

It consists of an expansion chamber or reservoir *D*, provided with a lever stop-cock *A*, which is to be connected with the Nitrous Oxide supply at the gasometer or cylinder by strong rubber tubing. Above this is the mixing chamber *E*, having a lever stop-cock *B*, connected by rubber tubing with the illuminating gas supply.

The chambers *D* and *E* are separated by a diaphragm having a regulating valve *C*, which perfectly controls the admixture of the two gases, which, when combined, are conducted through the outlet *F*, and flexible tubing *J*, to the blow-pipe tube *G*. This is provided with two interchangeable

nozzles with which to secure a large or small flame, a vertical wire standard *H* furnishes support for the nozzle when not in use.

The flange *I* is drilled for screws by which the apparatus may be secured in any convenient position to the bench, shelf or wall.

A stand for holding the N. O. Cylinder and blow pipe apparatus on one side while not strictly necessary, is recommended for convenience, and will be furnished when desired.

Extra heavy cloth-lined rubber tubing for connecting with cylinder and reducing couplings connecting a large tube to a small one will be furnished to order.

The apparatus is neat and complete in every respect, and will take gas from either cylinder or gasometer, a point that is not covered by any other Nitrous Oxide Blow-Pipe on the market. We take pleasure in recommending it to the profession.

We desire to call attention to the advertisement of George E. Smith in this issue. His stone cut lams are generally known and universally commended by all who use them.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA—TENTH ANNIVERSARY MEETING, ASSOCIATION HALL, CORNER FIFTEENTH AND CHESTNUT STREETS, PHILADELPHIA, DEC. 12-13, 1888.

Reduced rates have been secured at the Colonnade, 15th and Chestnut Streets, which will be made headquarters.

PROGRAM:

Call to order by the President, Dr. E. C. Kirk, promptly at 2 P. M., Wednesday, December 12.

Exercises will be opened by prayer by Rev. Wayland Hoyt, D.D., Philadelphia.

Introductory address by Prof. Chas. J. Essig, Philadelphia.

Response by Dr. A. L. Northrop, New York, followed by papers as follows:

Etiology of Caries, A Few Thoughts Thereon, by Dr. Geo. S. Allan, New York.

Removable Crown and Bridge Work, by Dr. S. S. Waters, Baltimore.

The evening session will be given to Lantern exhibits by Drs. Allan, Andrews and Sudduth, illustrating their views of Dental Histology and Pathology in their direct bearing upon the problem of decay.

Thursday morning will be devoted to clinics at the Hazeltine building, 1416 Chestnut Street.

Dr. Edwin P. Wright, Richmond, Va., will demonstrate his method of bleaching teeth.

Dr. W. Storer How, Philadelphia, Porcelain Inlays.

Dr. H. A. Parr, New York, Removable Bridge-work.

Dr. H. C. Register, Philadelphia, subject to be announced.

Dr. W. G. A. Bonwell, Philadelphia, will exhibit his system of correctors, with remarks and demonstrations from practical cases.

Dr. A. G. Bennett, Philadelphia, Bridge-work.

Dr. J. A. Woodward, Philadelphia, will show his illuminating apparatus.

Dr. E. P. McLean, Boston, will give a clinic on his method of finishing fillings, sharpening and polishing instruments.

Dr. T. S. Waters, Baltimore, will show Crown and Removable Bridge-work.

Dr. H. W. F. Buttner, Baltimore, will demonstrate his method of mounting Crown and Bridge-work, with instruments used.

Thursday afternoon, 2 P. M., Association Hall, Dr. James Truman, Philadelphia, will read a paper on Treatment and filling of root canals.

Dr. S. H. Guilford, Philadelphia, will give a paper on The Voluntary Movement of Teeth, Causing Abnormal Interdental Spaces.

Dr. S. G. Perry, New York, will treat of The treatment of proximate surfaces.

L. ASHLEY FAUGHT, D.D.S., Chairman.

DANIEL NEAL McQUILLAN, D.D.S.,

Secretary of the Anniversary Committee.

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
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